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MODERN GEOGRAPHY SERIES

BOOK V

ASIA

BY

W. B. CORNISH, B.A.

FORMERLY HEADMASTER, GORING HALL SCHOOL, WORTHING

Cert



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PREFACE

Asia is the fifth of a series of eight books, issued under the general title "Modern Geography", and has been written primarily to meet the needs of pupils preparing for the General Certificate of Education at the Ordinary Level and for other examinations of similar standard.

The first three chapters are devoted to descriptions of the more general features of the geography of the continent as a whole. In the remaining chapters emphasis is laid on the regional aspects, and an attempt has been made to keep a balance between physical, human, and economic considerations.

As in the other volumes, the numerous maps and pictures should prove to be a valuable and attractive feature of the book; many of them will provide material for discussion. I am greatly indebted to all those who have provided photographs; due acknowledgment is made below each illustration.

NOTE TO THE TENTH EDITION

THE text has again been very extensively revised to take account of the many political and economic changes in the area. The chief change in the political geography of Asia since the previous edition has been the separation of East Pakistan from the remainder of that country. This area has now been referred to as Bangladesh (Bengal State).

W. B. C.

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ASIA

CHAPTER I

RELIEF AND STRUCTURE: DRAINAGE

General Characteristics

The vast land-mass of Asia dwarfs the other continents in size, as a glance at any world map on an equal area projection will confirm. In latitude it extends from nearly 80° N. to nearly 10° S. (if we include the Indonesian Islands). In longitude it stretches from 28° E. to 165° W., a total of 167° , or nearly half-way round the globe. This means that when the people of Western Turkey are finishing their midday meal, those of Eastern Siberia are fast asleep at 1.30 a.m. on the next night.

It is obvious that over such an enormous area there must be great differences of relief, climate, and other geographical features, which in their turn have much affected the multifarious peoples so that there are also many different types of human society. Asia has indeed been called the "Continent of Contrasts"; here are a few examples which bear out the truth of this:—

1. It contains the highest parts of the earth's land-surface (Mt. Everest, 29,000 ft.) and the lowest (the Dead Sea Rift—1300 ft. below sea-level).

Off its shores, too, near the Philippine Islands is the deepest known part of the ocean floor (5900 fathoms).

2. It has the coldest place in the Northern Hemisphere in January and the hottest in July. Verkhoyansk in North-Eastern Siberia has a mean January temperature of -51° C. (-60° F.), and several places in North-West India and the Persian Gulf area record a mean of over 35° C. (95° F.) in July. Incidentally, Verkhoyansk has the greatest known annual range of temperature, *i.e.* 67° C. (120° F.).

3. The greatest known annual rainfall in the world is that of Cherrapunji in Assam (432 in.), but Asia also contains the largest area in the world with less than 10 in. This area extends from the Red Sea to Mongolia.

4. The natural vegetation of Asia varies from the mosses and the lichens of the Arctic Tundra to the impenetrable tropical jungle of the south-east.
5. In the fertile alluvial lowlands of the monsoon lands there are the most densely peopled areas of the world. In the belt extending from India to China are packed about one-half of the world's population. Yet in the area of less than 10 in. rainfall and north of it to the Arctic shores is the most extensive area of sparse population.

Asia may also be called the "Continent with a Past and a Future". In Iraq and the lower Indus Valley there were civilisations contemporary with that of Ancient Egypt and of equal standard. Another developed somewhat later in China. All were flourishing when the peoples of North-West Europe were still savages. Then came a decline. There are many signs that the Giant of the East is awakening, prodded by the impact of the Western civilisations. The huge territories of the Soviets in Asia have been steadily developed; Japan has become the third largest trading nation in the world, and most other countries are modernising their agriculture and developing mining and manufacturing industries. The Turks have become Westernised and this process is well under way in Iran. By Westernisation we do not mean merely the wearing of European dress and the adoption of the roman handwriting. It goes much further than that, and includes, e.g., legal procedure, and the methods of government.

The transition from sleep to wakefulness is seldom completed without a period of restlessness. There is no continent with so many grave problems as those of Asia, not even Europe. In the Levant there is the seemingly insoluble problem of reconciling conflicting interests and viewpoints, in India the disputes between the two countries and the antagonism of Hindu and Moslem, in the Far East the rivalries of the Nationalists and Communists in North and South Vietnam, North and South Korea and between China and Taiwan. Ultimately, so great are the natural resources and so numerous the population, with such varied abilities, that the peoples of Asia cannot fail to play a leading part in world affairs. If

they, and particularly those of the south and east, rigidly adhere to the guiding principles of their great religions, it may well be for the world's good. We must remember that all the great religions originated in Asia, i.e. Christianity, Muhammadanism, Hinduism, Buddhism, Judaism, and the philosophy of Confucius.

One of the most serious problems is that of the resettlement of millions of refugees displaced by political changes since the Second World War. (i) At the partition of India some 8,500,000 Hindus moved eastwards and 7,500,000 Moslems westwards. In 1971 some 9 millions crossed from East Pakistan into West Bengal, but nearly all have returned. (ii) With the expansion of Israel in 1949 there were 880,000 Arab refugees; of these, Jordan received 476,000; Gaza (Egypt), 209,000; Lebanon, 104,000; Syria, 84,000; Iraq, 5,000. Most of these are still in refugee camps maintained by U.N.R.R.A. (United Nations Refugees Relief Association), and their presence is a major factor accounting for the bitterness of the Arabs towards the Jews. Most of Jordan's troubles have sprung from the discontent among its Palestinian Arab refugees. (iii) The Chinese Civil War led to the flight of unknown numbers. (iv) The Korean War caused 2,750,000 North Koreans to take flight to the South, and well over 1½ million moved from North to South Vietnam for a similar reason.

Apart from the involuntary movement of refugees, there has for many years been a voluntary migration on a large scale from over-populated areas of India, and especially China, to the rapidly developing lands of South-East Asia, particularly Malaysia and the East Indies. As Chinese do not assimilate with the indigenous population their presence in such numbers is bound to cause misgivings, particularly as they have strong ties with their homeland and as the latter is now under a Communist régime. This is one of the greatest sources of worry to the Federation of Malaysia and to Singapore. Most of these Chinese immigrants come from the island of Hainan and the southern provinces of Kwantung and Fukien. There are 350,000 in Burma, 180,000 in Cambodia, 2,200,000 in Indonesia, 2,550,000 in Malaysia, 200,000 in the Philippines, 920,000 in Singapore (over 80 per cent. of the population), 800,000 in South Vietnam, and 100,000 in North Vietnam.

As to the western boundary of Asia with Europe, this is usually taken to be the line of the Ural Mountains to their southern end, where it turns westwards along a line of low hills towards the Volga River, but before reaching the latter it again turns southwards to the Caspian, keeping parallel with the river and about 50 miles from it. Finally, in the area between the Caspian and the Black Seas, the crest of the Caucasus Mountains is normally regarded as the boundary. All this is very arbitrary as, apart from the Caucasus, there is no effective barrier between the continents. With the expansion of Russian government across Siberia and beyond the Caucasus it has become increasingly difficult to regard the boundary as a real one. Indeed, some authorities prefer to think of the U.S.S.R. as an Oriental rather than as an Occidental Power, basing this opinion upon the general outlook and mental make-up of the population of the European section.

Relief and Structure

Extending from the Ural Mountains in the west to the Lena River in the east is the greatest continuous lowland in the world—the Siberian Plain. The western half as far as the River Yenisei is a flat area composed mainly of recent sedimentary rocks, but beyond the Yenisei there is an eroded plateau formed of Palaeozoic rocks of a more resistant type. Structurally the whole of the lowland is a table of great solidity which has resisted folding, and the Primary rocks of Palaeozoic sedimentaries extend throughout the area, but in the western part they remain covered with glacial debris deposited during the Ice Age. The debris has been removed from the higher eastern part. The latter is a complex drainage area, the main and secondary watersheds forming ranges which rise to 3,000 ft.

Pressing on this area to the west, south and south-east there is a great but broken crescent of ancient fold ranges including the Altai and Sayan Mountains, some of which reach 14,000 ft. To the south-east there are the lower and broken Yablonovyy and Stanovoi Ranges. Fringing the southern edges of these up-folds there is a series of depressions some of which form great basins partly flooded by such

inland seas as the Northern Caspian, the Aral Sea, and Lake Balkash. It should be noted that the Khirghiz Steppe is structurally one of these lowlands and not an extension of the Siberian Plain. The Dzungarian Gate, a depression between the Altai and Tien Shan Ranges, has played a major



Fig. 1. ASIA—GEOLOGICAL STRUCTURE.

part in determining the routes of Central Asia. All these depressions are synclinal. Every wave consists of a trough and a crest. Fold ranges are the crests of earth waves and are said to be anti-clinal, whilst the corresponding troughs are synclinal. (See Book I, pp. 76-7, for an explanation of fold mountains.)

To the south-west of this fold system is another much younger one which provides the most impressive mountain scenery in the world. The folding occurred during the Tertiary, or third, period of geological history, *i.e.* about 50 million years ago, compared with the 400 million years ago of the older ones. It is an extension of the ranges which border the shores of North-West Africa and Southern Europe. The system enters Asia in the west of the Peninsula of Anatolia (Asia Minor) by two east-west ranges—the Pontic Mountains in the north and the Taurus Ranges in the south. These are continuations of the Greek Pindus Ranges to which they are linked by lines of islands which trace for us the submerged parts of chains. The two ranges enclose like pincers a great massif of ancient rock which forms the core of the peninsula. At their eastern end they converge in Armenia to form the knot of Mount Ararat, the central and culminating point of a volcanic area. It is a characteristic of fold ranges that volcanic outbursts and earthquakes are liable to occur along their flanks, no doubt because the very folding that gave rise to these ranges has weakened the crust and enabled the lava to burst through. Nowhere is this more probable than where two or more crests converge, as is the case with the Armenian area. That the Anatolian area is still in a very unsettled state is proved by the several disastrous earthquakes of recent years.

To the north-east of this volcanic mass there is a synclinal lowland mainly drained into the South Caspian, itself part of this syncline. Beyond this again are the Caucasus Mountains, a continuation of another European fold which, after forming the curving Carpathians and Transylvanian Alps, turn eastwards to the Black Sea as the Balkan Range. The fold system reappears as the mountains of Southern Crimea, and then as the much more majestic Caucasus which rise in Mount Elbruz to 18,000 ft. Where the fold ranges reach the Caspian they form the Apsheron Peninsula. The narrow part of the Caspian links the two synclines that we have already mentioned, and then the fold recovers again in the Asiatic Balkans only to die away to a northward curving line of downs, regaining height in the Altai Mountains.

Returning to Mount Ararat, we find that two groups of ranges diverge to the east and south-east to enclose the next resistant mass, the plateau of Iran. The northern group

forms the Elburz Mountains which skirt the southern shores of the Caspian and then run in a general eastwards direction through the Koh-i-Baba to the Hindu Kush. The southern group, the Zagros Mountains, which overlook Iraq and the Persian Gulf, continues along the northern shore of the Arabian Sea, sending a spur across the Strait of Hormuz to the mountains of Muscat in South-East Arabia. The main fold continues almost to the mouth of the Indus and then turns suddenly northwards, making an S-shaped bend at Quetta. Here again there has been a weakening of the earth's crust, as proved by the destruction of Quetta by earthquake. This is a normal type of event where fold ranges make sudden bends.

Flanking the Punjab the fold continues northwards as the Sulaiman Range. In the tangled region to the north-west of India there is a meeting place of ranges in the highest mountain knot of all, the Pamir Plateau or "Roof of the World" as the local people call it. It is at this point that there begins the highest part of the earth's surface. From the Pamirs towards the north-east run the Tien Shan (24,000 ft.) and to the east—the Kun-lun (25,000 ft.). These two systems partly enclose the Tarim Basin. To the south-east run the successive ranges of the Karakoram (K2, 28,000 ft., the second highest peak in the world) and the Himalayas (Mt. Everest, 29,000 ft.). Between these and the Kun-lun is the Tibetan Plateau which averages about 15,000 ft. and is crossed by yet more ranges, in places exceeding 25,000 ft. At the eastern end of the plateau relief becomes very complicated, for suddenly every one of these fold systems, each consisting of several ranges, turns southwards to form the parallel chains of Burma. The most westerly, the Arakan Yoma, is continued through the Andaman and Nicobar Islands to become the "backbones" of Sumatra and Java and parallel Metawa Isles off the south of Sumatra. The eastern Burmese Ranges are squeezed into the Malay Peninsula and then, via the "Tin Isles" of Bangka and Biliton, swing north-eastwards through Borneo and the Philippines, Formosa and the Japanese Archipelago to the complex folded areas of North-Eastern Siberia, east of the Lena River.

The presence of this huge obstacle across the entire width of the continent has had a very important influence upon the

development of the various major civilisations. It has meant that, throughout the whole of the north, human movements have been mainly along the latitudes, Russian from the west, Mongolian from the east. It has meant the development of the Indian civilisation in the south in its turn isolated from the Chinese in the east.

The remainder of the continent consists chiefly of more tables of resistant rock forming the tilted massifs of Arabia, the Indian Deccan, and parts of Indo-China and China. Between the two former of these and the Tertiary anticlines there are the great synclines of the Tigris-Euphrates Valley, the Persian Gulf, and the Indo-Gangetic Plain. The only other structural feature worthy of mention in this brief survey is the great Rift Valley which, commencing in Syria, forms the deep depressions of the Dead Sea and the Red Sea. It is thought that this great fissure in the Earth's surface was in some way caused by the great stress exerted upon the crust by the gigantic east-west earth waves.

Drainage

Disregarding minor details one may see that the waterways of Asia are divided into four groups, viz.:—

1. An area of the centre, which can be called the Heart-land, extending from Anatolia in the west to Manchuria in the east and penetrating well into Europe in the great Volga Basin. It is a region of inland drainage where the rivers either flow into lakes such as the Caspian and Aral Seas or, like the streams of the Tarim Basin, become swallowed up in sandy wastes. Apart from the Syr and Amu Darias which flow into the Aral Sea there are no rivers of major importance on the Asiatic side. The lakes are the outstanding feature of the drainage system and of these the Caspian is by far the greatest. As we have mentioned, it has been formed by the flooding of the lower parts of two synclines. The Caspian is well below open sea-level and at its northern end there is a large area of land known as the Caspian Depression which is also below sea-level. The American geographer, the late Ellsworth Huntington, proved by his observation of the past shore-lines of the Caspian that its level has fluctuated, showing that there must have been climatic changes over its drainage area, because the volume of an inland sea depends upon the

amount of rain falling in the basins of its contributary rivers in relation to the volume of moisture evaporated over the whole of the basin. In wet cycles the amount received exceeds the amount evaporated so that the volume of the lake is increased and the shore-lines expand. In dry cycles evaporation exceeds precipitation, therefore the lake shrinks. In

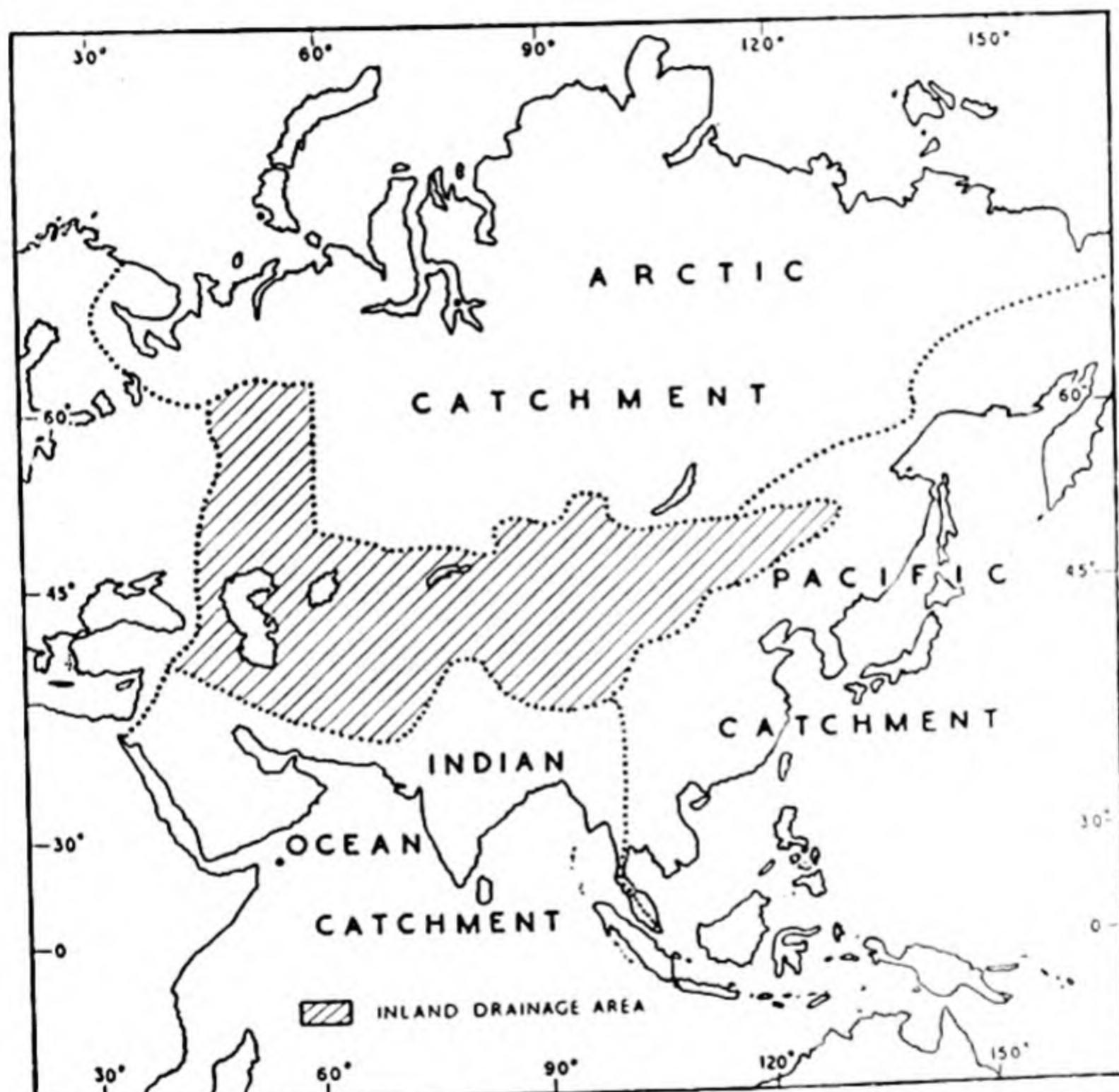


Fig. 2. CATCHMENT AREAS.

Persia and the high depressions of the Tarim Basin, and in the Gobi Desert, most of the areas shown as lakes are really salt pools, for they are fed only by streams which flow to them seasonally after the melting of the winter snows on the surrounding heights.

2. The Indian Ocean drainage area extends from the headwaters of the Tigris and the Euphrates to the Malay

Peninsula. The most important streams are the Indus and the Ganges-Brahmaputra, the two last named sharing the same delta. One interesting fact emerges from a study of the courses of these streams. The Himalayas, greatest of all mountain systems, do not form a major watershed, for the Indus and one of its chief tributaries, the Sutlej, and the Tsang-po, headstream of the Brahmaputra, all rise north of the ranges and break through them by narrow gorges into the Indo-Gangetic Plain. The three rivers have their sources very close to each other and can be compared with the Rhone, the Rhine, and the Aar in Southern Switzerland. It is probable that both drainage systems may be accounted for in the same way. There was once a river flowing in a single longitudinal valley, in the Asiatic case from the east to west via the Amu Darya to the Aral Sea. Short, very swift rivers on the opposite slopes of the mountains, eroding their courses very steeply, undercut the higher valley and so "captured" the longitudinal stream in three places. There are signs that other captures will one day take place, for several tributaries of the Ganges appear to be making gaps in the Himalayas.

There are numerous examples of river-capture (or beheading) in this drainage area, e.g. there used to be another Indus tributary rising to the east of the present series, but its headwaters were captured by the Jumna so that, now, deprived of its flood waters, the beheaded stream loses itself in the sands of the Thar Desert. Then again, in Burma, the Irrawaddy had as its original source the Chindwin. Flowing parallel to the Chindwin and separated from it by the Pegu Yoma, central range of Burma, was the less energetic Sittang. A powerful tributary of the old Irrawaddy cut a gap in the Pegu Yoma and drained off the upper part of the Sittang near the site of Mandalay.

3. The Pacific drainage area is a relatively small one, the outstanding rivers being the Chinese Yangtse and Hwang-Ho. The watershed between this drainage area and the Indian Ocean area is very finely drawn, for in South-East Tibet there is a succession of rivers flowing towards the south-east, and those flowing to the Pacific are divided from the others by

a narrow mountain ridge which ultimately becomes the backbone of Malaya. Here again we could find plenty of examples of river-capture but we must content ourselves with pointing out the excellent one of the beheading of the Sikiang by the

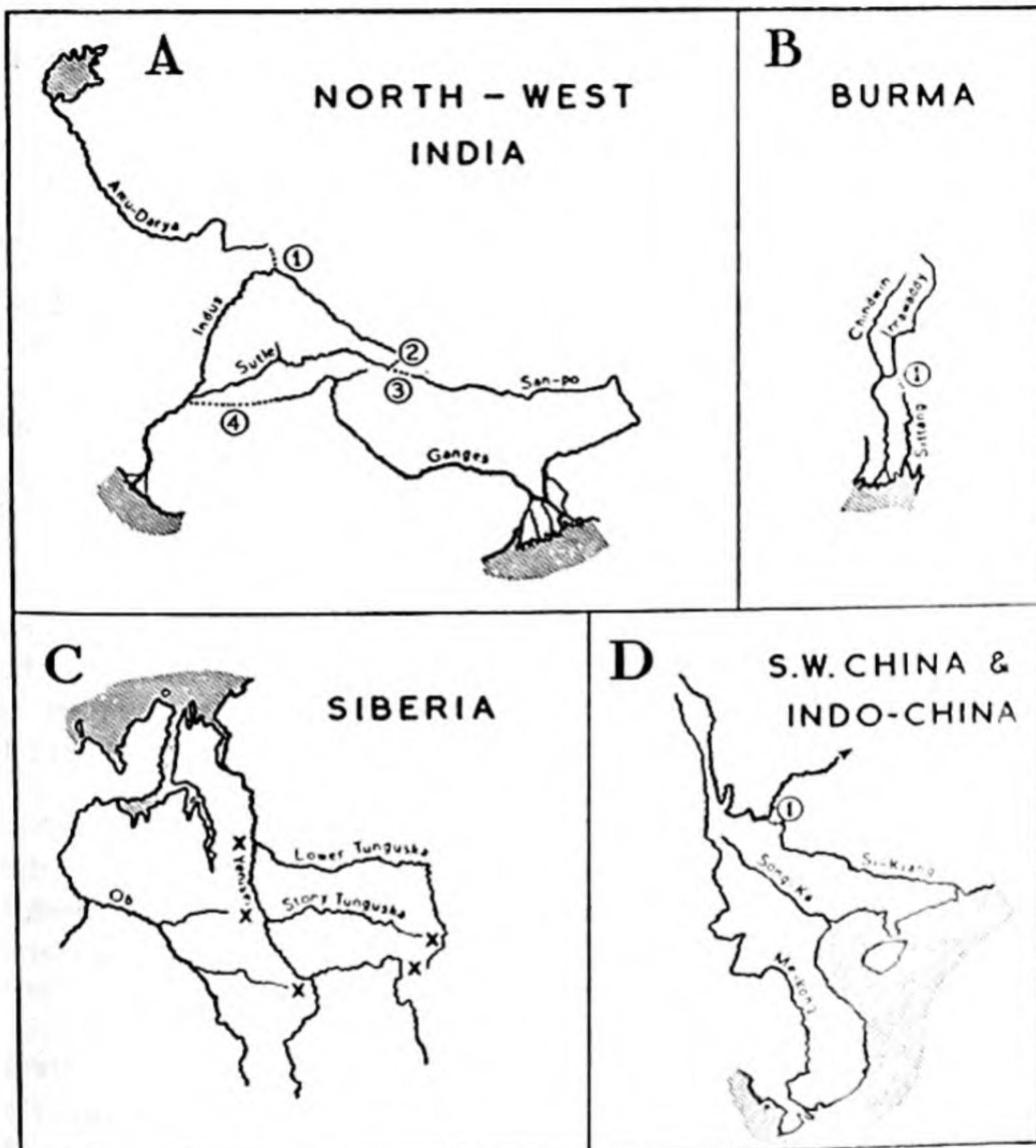


Fig. 3. SOME EXAMPLES OF RIVER-CAPTURE IN ASIA.

In A, B, and D numbers represent the former drainage lines. In C points of river-capture are marked "x."

Yangtse. Note, too, that the Song-ka of Tonking appears to be about to rob the Mekong.

4. The largest drainage or catchment area is that feeding the Arctic. The three principal rivers are the Ob, Yenisei, and Lena, all rising in the northern fold area, but the former

two flow across the Quaternary rocks of the western section, whilst the last named flows across the ancient rocks of the eastern. They all have one feature in common—they rise in warmer southerly latitudes and flow to the Arctic. Therefore in spring the upper courses thaw before the lower and are fed by the melting of the winter snows. This results in extensive flooding in the lower basins followed by more flooding in the autumn when the lower courses freeze first. An examination of the map shows that the West Siberian rivers have similar features to those of Northern Europe in that they zig-zag across the plain in a general S.E.-N.W. direction with well-developed east-west tributaries. In both areas the great ice-sheets deposited accumulations of debris, called moraines, which stretch roughly from east to west.

When a warmer climate returned at the close of the Glacial Age and the rivers began to flow again, they were forced into parallel east-west courses along the southern edges of the moraines. The Siberian ones then drained into the great Gulf of Ob. Next, swift streams rising on the northern edges of the moraines undercut the lower east-west rivers, resulting in another type of river-capture. Fig. 3C shows how the present Lower and Middle Yenisei have played a big part in this process. Note particularly how the three right bank tributaries, the Tunguskas, must have once continued westwards to the Ob basin until they were diverted. A further capture seems imminent by a tributary of the Ob in the foothills of the Sayan Mountains, and the Lower Tunguska has robbed its fellow, the Stony Tunguska, of its headwaters.

These rivers rank amongst the longest in the world, but are of little importance because they flow into the Arctic. Taking the main streams only, the Ob measures over 2000 miles, the Yenisei nearly 2,000 miles, and the Lena nearly 2,500 miles. In the extreme north-east there is a series of shorter, swifter streams draining the Chersk and the Anadyr Mountains.

Coast Lines

The coasts of the three oceans bordering the continent each represents a very different type. That of the Indian Ocean describes two great bays, the Arabian Sea and the Bay of Bengal, with two large gulfs projecting from the former, the

Red Sea-Gulf of Aden and the Persian Gulf. The former is part of the Great Rift Valley and the latter the flooded part of the Mesopotamian Syncline. Note how the main lines of direction of the Red Sea, Mesopotamia, the west coast of India, the Arakan Range, and Malaya turn generally from north-west to south-east, whilst there are indications of minor direction lines at right angles in the coast of Arabia, the north-east coast of India, and the Indus Valley. This parallelism of surface features is common in areas where there has been much faulting and fracturing of the crust, *e.g.* the Scottish Highlands. Note, too, that the phenomenon is continued along the east coast of Africa.

Turning to the Pacific, we find a similar north-west to south-east trend (in, *e.g.*, the Malayan coast, Indo-China, the north-east coast of China, the Korean Peninsula, Sakhalin, and Kamchatka) with minor trends at right angles (*e.g.* Cochin China, S.E. China, and the south-east coast of Honshu, Japan). This feature is overshadowed in the Pacific by the "festoons" of islands where archipelagoes appear to hang from the mainland, *e.g.* the Japanese group. On examination, however, it is clear that these festoons are themselves part of the same north-west to south-east and north-east to south-west structure lines.

Compared with the other two, the Arctic coast has few outstanding features. We may note, however, that in the west the rivers flow into long estuaries and in the east they form deltas. This difference is largely caused by the different characters of the respective basins. The rivers of the west wander over relatively flat areas so that their rate of flow is slow. Therefore, they drop most of the load derived from the upper courses before they reach the sea. Those of the east are much swifter so that they bring the silt right down to their mouths. In addition the tidal scour in the Western Arctic is much more vigorous than that of the eastern part.

CHAPTER II

CLIMATE: NATURAL REGIONS

It is, of course, impossible to talk about "the climate of Asia" owing to the vast area involved. Before we proceed to divide the land-mass into climate sub-divisions there are certain controlling factors which must be understood because they influence, in varying degrees, the climatic phenomena of the different parts.

Firstly, there is the vast area to be considered. In winter the interior becomes extremely cold owing to the great distance from the sea. The whole of the area north of a line from Anatolia through Northern Persia and along the edge of the Himalayas to Central China as far south as the Yangtse basin has average temperatures below freezing point in January, and much of it is nearly 32° F. below zero. This means that the air becomes very dense and the atmospheric pressure is high. There is a large area over Mongolia where the average pressure in January exceeds 30.6 in., and the whole of Asia with the exception of Southern India, Indo-China, and the East Indies, a narrow belt along the Arctic shore and the peninsulas and islands of the north-east, has an average January pressure of over 30 in. As the winter progresses so the cold becomes more intense and the density of the air increases, *i.e.* the pressure becomes higher. Throughout the winter the air is literally pressed outwards by other air accumulating above it, so that there is a general movement from the interior to the coastlands—westwards to the Atlantic, southwards to the Indian, and south-eastwards to the Pacific Oceans where the winter pressure is low owing to the relatively higher temperatures. This out-flowing dry air causes Asia to be rainless over the greater part in winter. Pressure differences are highest from January onwards so that the wind-force is greatest in the second half of the winter.

In summer, on the other hand, the air becomes very hot. Most of the continent has average temperatures above 18° C. (64° F.) except for a belt along the north and an "island" in the Central Highlands where the temperature falls below -9° C. (16° F.) on the plateau of Tibet. There are large areas bordering the Persian Gulf and in Northern India where the July

temperatures average more than 27° C. (80° F.), nearly 35° C. (95° F.) in Iraq, and 35.6° C. (96° F.) in the north-west of India. This heat causes the air to expand and rise and there is an area of low pressure extending over the whole of the continent with the lowest centre in the Punjab where it is less

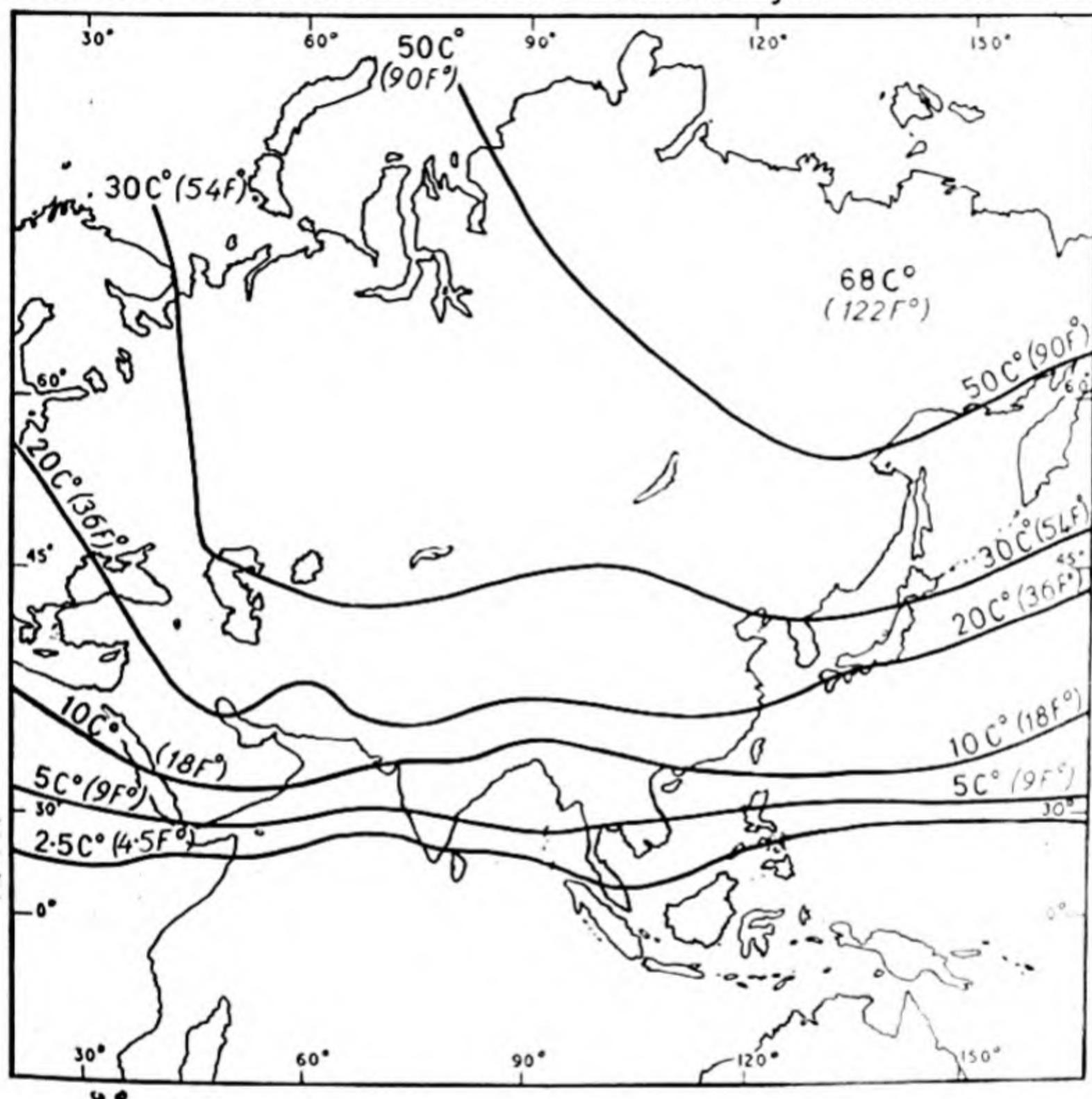


Fig. 4. ANNUAL RANGE OF TEMPERATURE.

Note the increase in range towards the north-east. Verkhoyansk Northern winter "Pole of Cold," is also the place with the greatest known range of temperature.

than 29.4 in. This leads to an inflow of air from the whole of the surrounding areas of higher pressure so that most of the continent has its main rainfall in summer.

The second major controlling factor is the relief barrier which extends throughout the width of the continent.

Together with the effect of great distance from the sea it causes large areas of the interior to have a very low rainfall. The effect of the barrier is seen in the distribution of temperature map showing actual temperatures. In January the southern edge of the barrier roughly coincides with the 9° C. (48° F.) isotherm, *i.e.* the boundary between warm and cool winters.

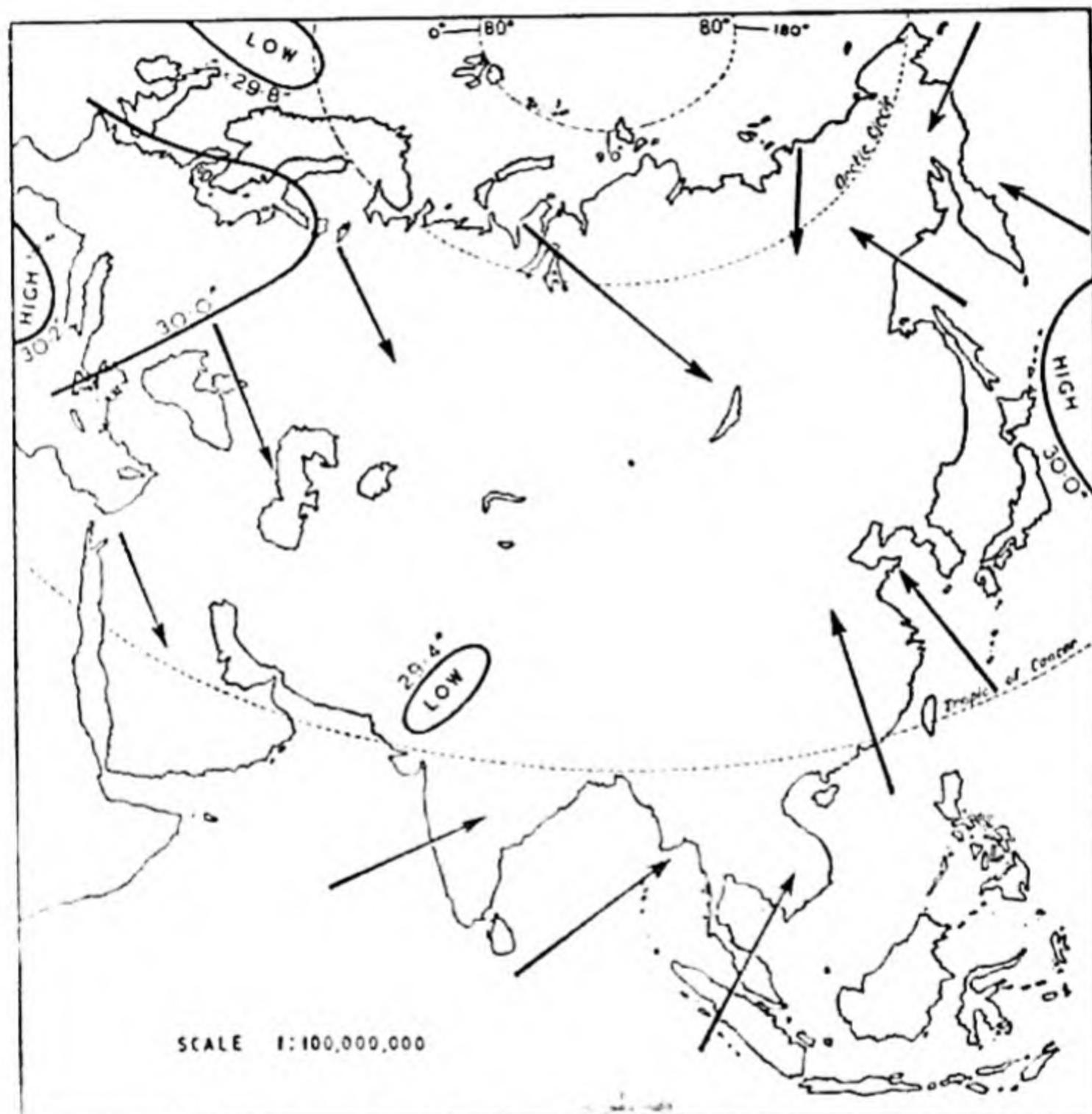


Fig. 5. WINDS AND PRESSURE—JULY.

A third control is the open nature of the European margin from the Arctic to the Black Sea, for the Urals form a very ineffective barrier. Note also how the Baltic and Mediterranean-Black Sea "inlets" allow Atlantic influences to penetrate much further eastwards than would have been the case had the European coast been unindented. The former



Above: KASHMIR. THE GILGIT VALLEY, SHOWING NANGA PARBAT (26,670 ft.)
VIEWED FROM THE WEST. (Lachman News Agency.)

Below: MOUNT EVEREST. (Keystone.)



Above: A

KOL VALLEY, SHOWING RIVER MEANDERS. (Exclusive News Agency.)

Below:

IN A TUNDRA, WITH HERD OF REINDEER. (Exclusive News Agency.)

has its greatest effect in the summer when the low pressure of Central Asia allows depressions to cross the continent. This accounts for the belt of fairly heavy rainfall shown on the summer rainfall map as extending across the Siberian Plain. In winter the intense high pressure over the land-mass

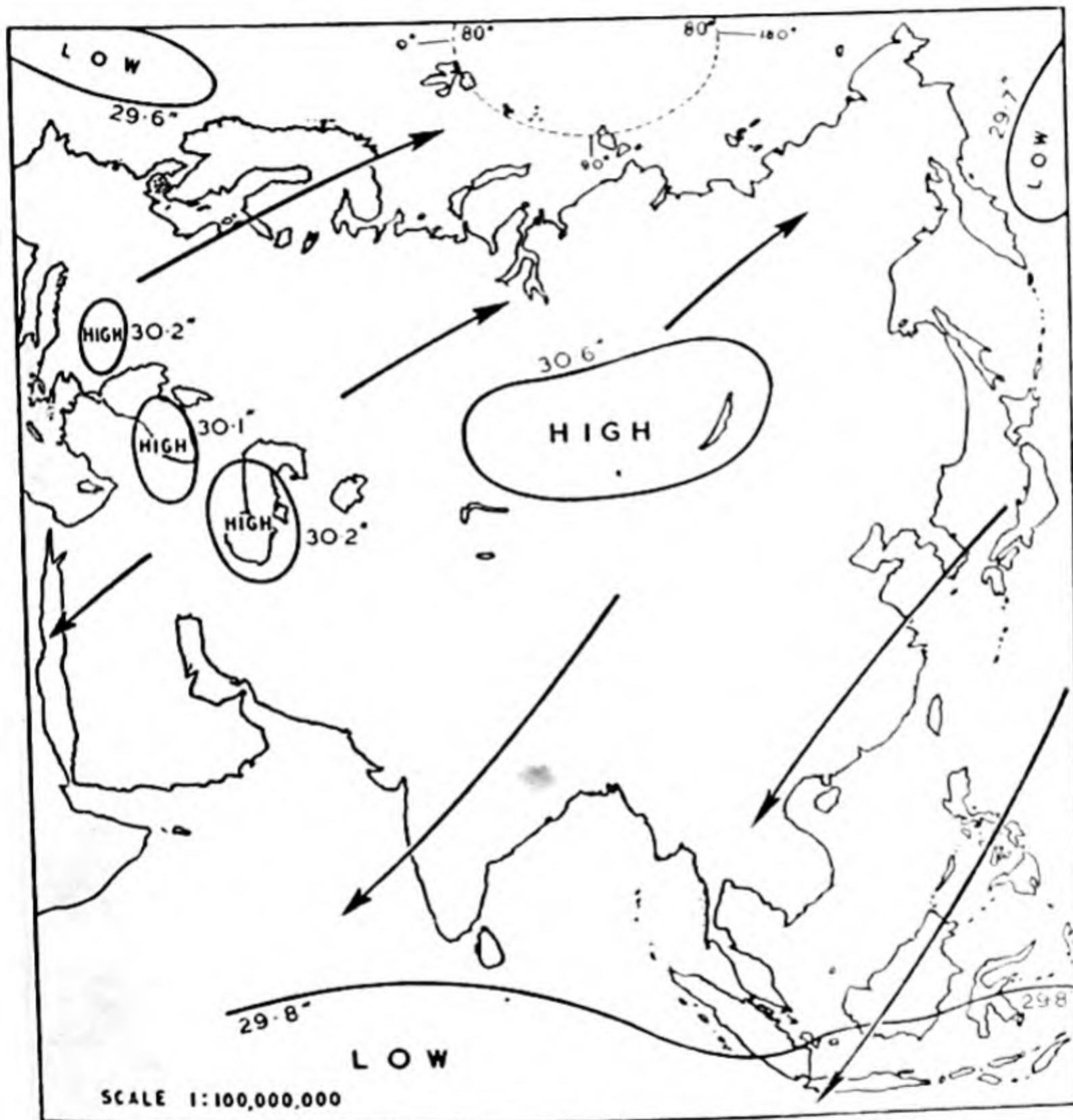


Fig. 6. WINDS AND PRESSURE—JANUARY.

prohibits any penetration from the west. Indeed, there is often a strong outflow in the opposite direction which accounts for the bitterly cold easterly winds which sometimes reach our own shores. They are particularly liable to occur in the second half of the winter when the temperatures are at their lowest in Central Asia. At this season it is the

Mediterranean "inlet" which has the greater effect on Asiatic climate for it is then that Atlantic depressions follow more southerly routes. Some of them enter and pass right across the Mediterranean bringing rain to an area extending from Anatolia to Upper Ganges Basin and from Palestine to the Caspian.

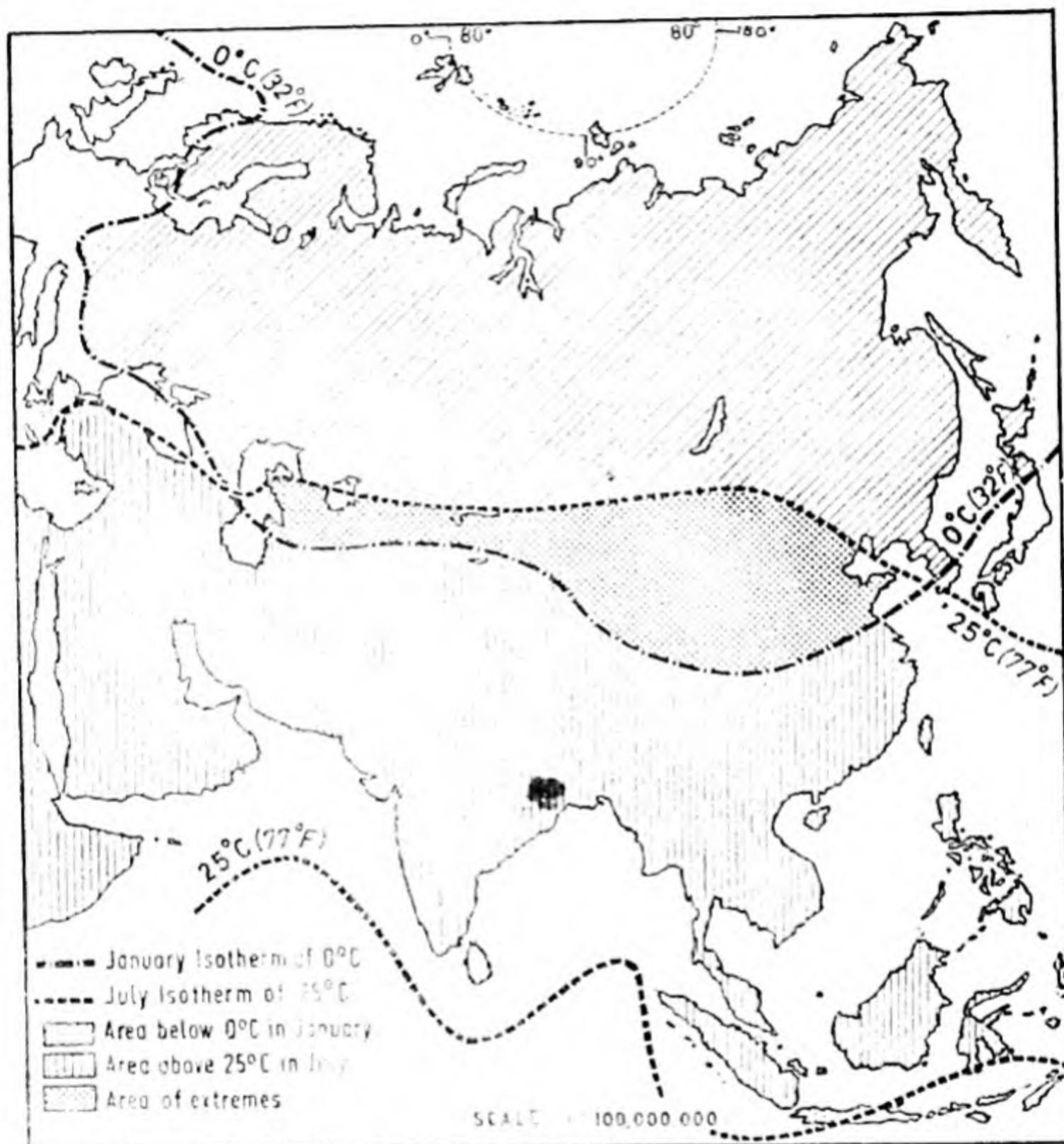


Fig. 7. THE BELTS OF SUMMER HEAT AND OF WINTER COLD.

THE NATURAL REGIONS OF ASIA

A natural, or geographical, region may be defined as a part of the earth's surface that has a relief, climate, and natural vegetation differing from those of the areas bordering it. It must be remembered that these regions are purely arbitrary and this particularly applies to the boundaries.

Normally on a journey across a continent one would pass very gradually from one region to another.

Bearing these points in mind, let us apply them to Asia. We may divide the continent into 13 major natural regions. The table on pp. 24-7 shows the climatic statistics for places

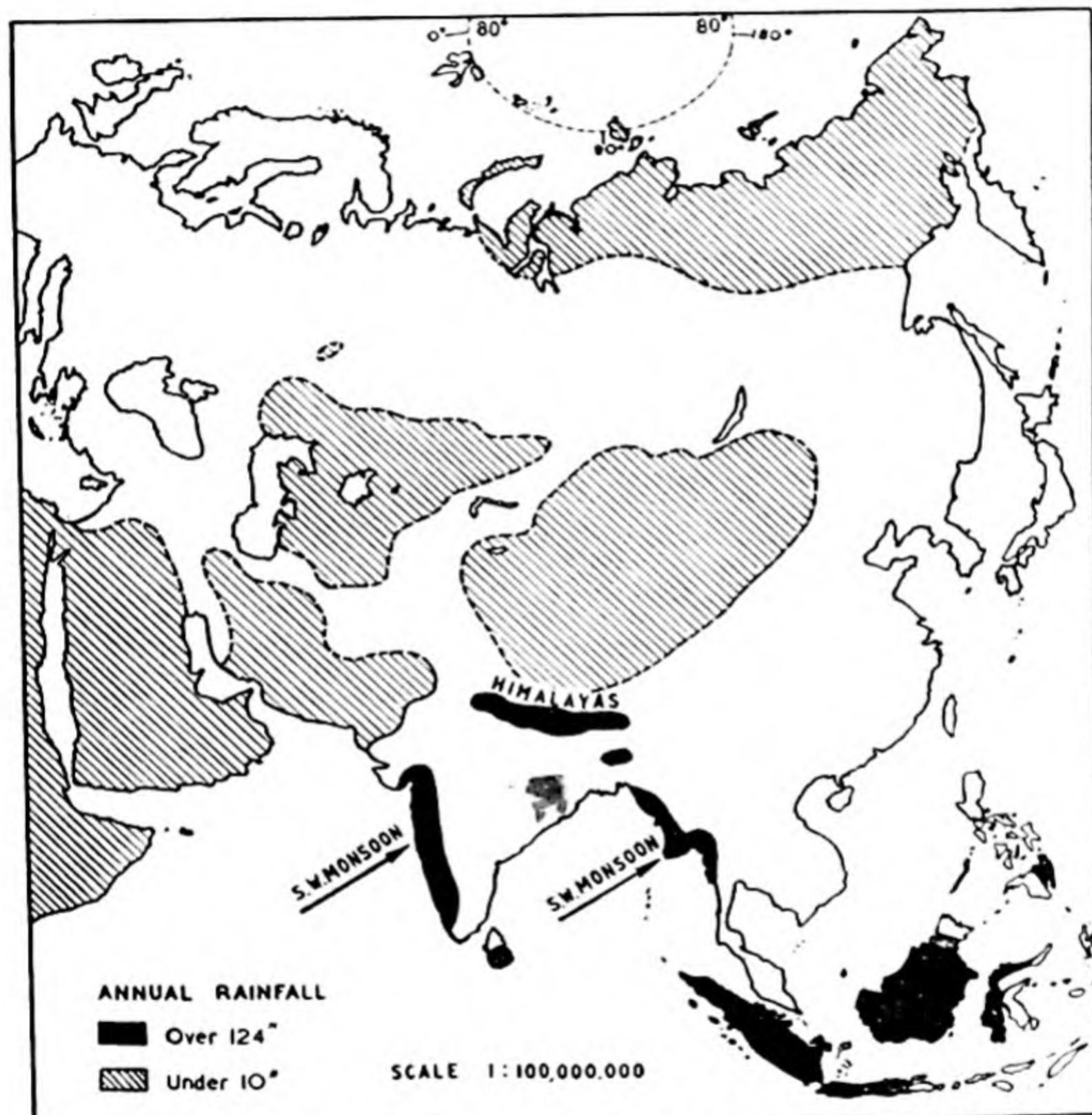


Fig. 8. MEAN ANNUAL RAINFALL.

Note the effect of the Himalaya barrier on the rainfall of opposite sides.

in each, except in the case of the Tundra, for which none is available. Here, then, is a list of the regions together with the type to which each belongs, so that it may be compared with similar regions in other continents already studied.

(1) MALAYA, THE EAST INDIES, CEYLON, AND THE EXTREME SOUTH-EAST OF INDIA. EQUATORIAL LOWLAND TYPE.

Similar regions: Amazon lowlands, Congo Basin, and Guinea coastlands; north-west coast plain of South America; coastal lowlands of Central East Africa.

• (2) A BELT EXTENDING FROM THE WEST COAST OF INDIA THROUGH BURMA, SIAM, AND INDO-CHINA TO THE EXTREME SOUTH OF CHINA. MONSOON TYPE. Similar regions:

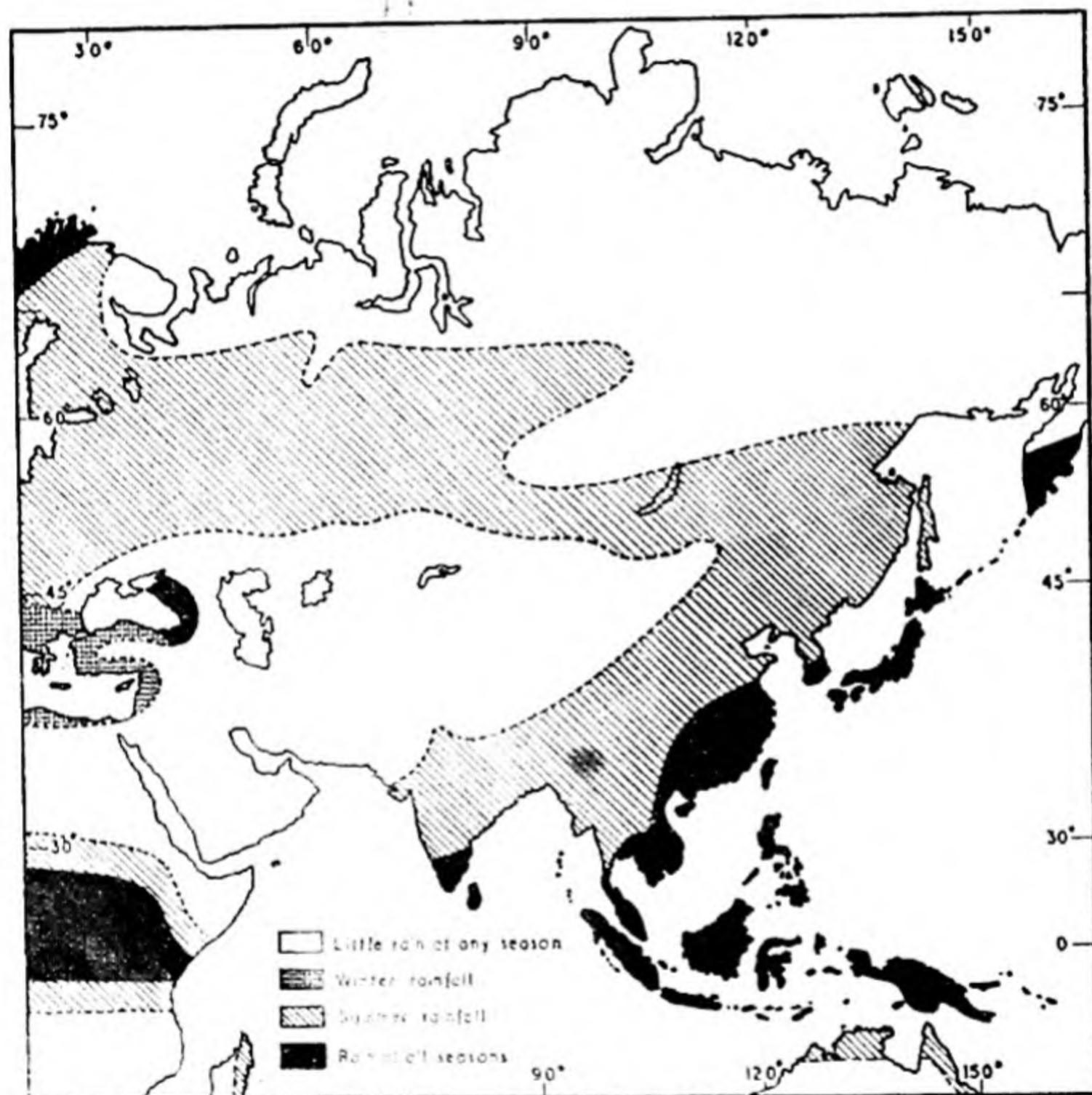


Fig. 9. SEASONAL RAINFALL.

Note the influence of prevailing westerly winds across the centre of the continent in summer.

Abyssinia; Madagascar and the opposite shores of Africa; Liberia and Sierra Leone; the north-east corner of Brazil and the northern and north-eastern coastlands of Australia. Some authorities include Central America, the Gulf Plain of U.S.A., the West Indies, and the northern coastlands of South America in this type.

(3) ARABIAN PENINSULA AND THE LOWER INDUS BASIN. HOT DESERT TYPE. Similar regions: the North African deserts, the Kalahari, the Atacama, the West Australian, and the North American deserts.

(4) THE WESTERN SHORES OF ANATOLIA, SYRIA, PALESTINE, AND THE MESOPOTAMIAN LOWLAND. EAST MEDITERRANEAN TYPE. Similar regions: the Valley of California, the Santiago Valley of Chile, the Kalgoorlie area of West Australia.

(5) IRAN AND CENTRAL ANATOLIA. IRAN TYPE. Similar regions: Plateau of the Shotts (Algeria); the Meseta (Spain); the Basin of the Great Salt Lake (U.S.A.).

(6) TURKISTAN. TURAN TYPE. Similar regions: the high plains east of the Rockies; North-West Argentina; the South African Veldt; the Murray-Darling Basin.

(7) SOUTH-WESTERN SIBERIA, CENTRAL MANCHURIA. PRAIRIE OR CONTINENTAL TYPE. Similar regions: the American Prairies, the Plate Lowlands; the Black Earth Region of the Ukraine.

(8) TIBET. TIBET TYPE. Similar region: the Bolivian Plateau.

(9) THE GOBI DESERT; THE TARIM BASIN. TEMPERATE DESERT TYPE. Similar region: Patagonia.

(10) THE SIBERIAN FOREST. NORTHERN FOREST TYPE. Similar regions: the Alaskan and Canadian Forest belt; the Scandinavian and North Russian Forests.

(11) NORTHERN CHINA AND NORTHERN JAPAN, EASTERN SIBERIA. ST. LAWRENCE TYPE. Similar region: the north-east of North America (Newfoundland, the Great Lakes, St. Lawrence Valley, Maritime Provinces, New England).

(12) SOUTH-EASTERN CHINA, SOUTHERN JAPAN. CHINA TYPE. Similar regions: South-Eastern U.S.A., South-Eastern Brazil, coastal plains of New South Wales and Queensland.

(13) THE SIBERIAN TUNDRA. TUNDRA TYPE. Similar regions: the continuation into Northern Europe, the Tundra of Arctic Canada, Labrador, and West Greenland.

Let us now examine each of these regions in more detail to study the climatic characteristics and the natural vegetation.

(1) MALAYA, THE EAST INDIES, CEYLON, SOUTH-EAST OF INDIA. *Climate*.—As the figures for Singapore show, there is very little difference in temperature throughout the year. Note that the average maximum is reached in May just after the period of overhead sun for the latitude. From its near-

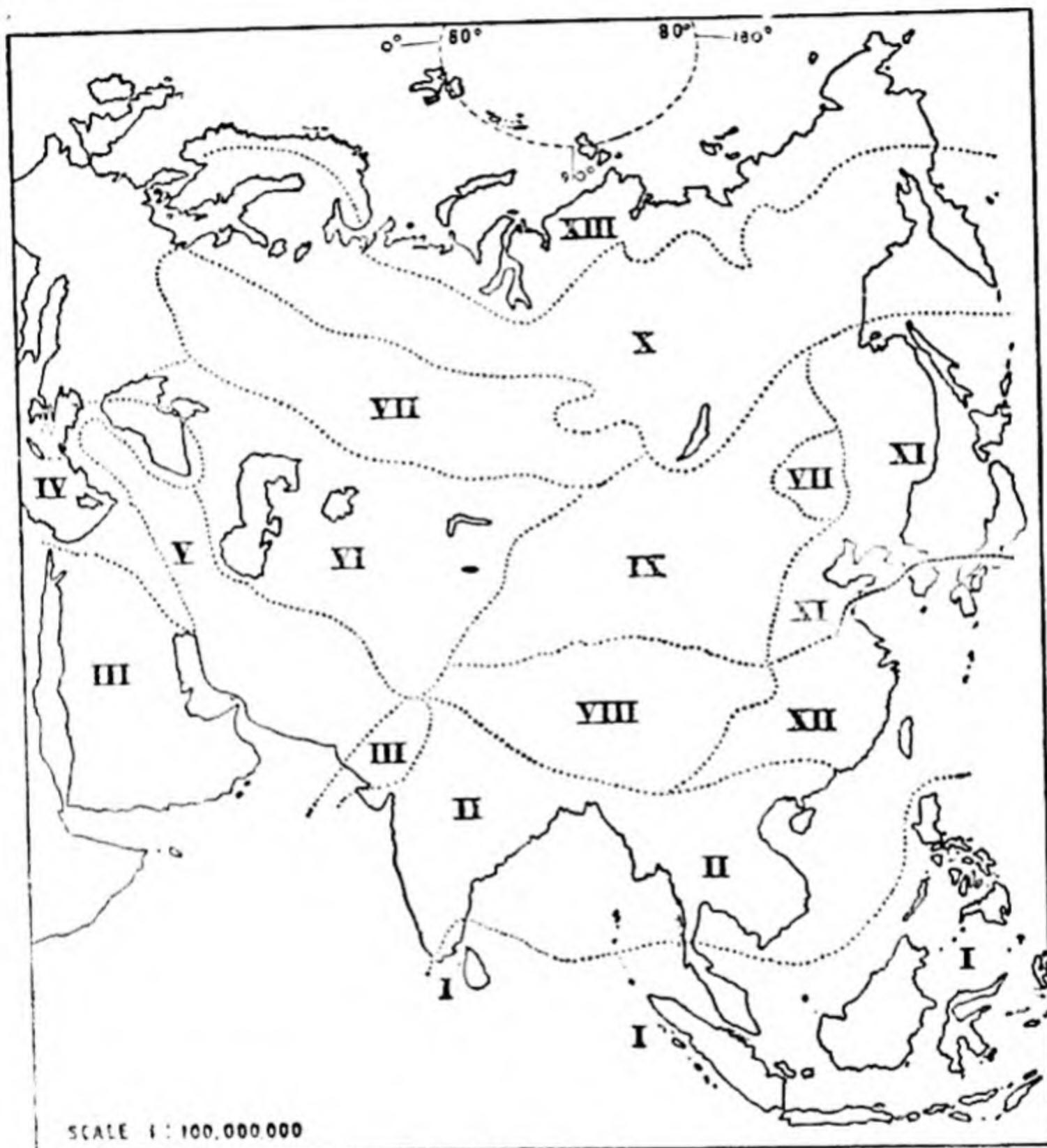


Fig. 10. THE NATURAL REGIONS OF ASIA. See pp. 18-22.

Equatorial position it is obvious that the whole of the region has a vertical, or almost vertical, midday sun. True, a place on the Equator has the noon-sun at an angle of $23\frac{1}{2}^{\circ}$ from the vertical or a place on latitude 8° N. has it at an angle of $31\frac{1}{2}^{\circ}$ from the vertical at its midwinter solstice. Compare this, however, with Southern England where, even when the sun

is at its highest, the angle is $27\frac{1}{2}^{\circ}$ and in midwinter it is $74\frac{1}{2}^{\circ}$ from the vertical.

Although there is a very small annual range of temperature, there is a fairly high diurnal one. Thus Singapore has an average diurnal range of 10 C.° (14 F.°) and this is typical of the region. The atmospheric pressure remains low throughout the year owing to the heat. At Singapore the average is just about 29.8 in., which is also the figure for Jakarta (Batavia). At Colombo there is a slight variation, the pressure rising to nearly 29.9 in. in January and falling to just below 29.8 in. at midsummer.

Because of the constant low pressure the air rises. It is saturated with moisture and, on cooling, releases most of it so that throughout the year there is a heavy rainfall. The mean annual rainfall at Singapore is 92.9 in. In no month does it fall below 6 in., but there is a definite maximum of over 10 in. in December. At Colombo there is an annual rainfall of 87.2 in. with double maxima in May and October of about 13.5 in. In February the rainfall decreases to 2 in. and in August to 3 in. This seasonal fluctuation is a characteristic of places in the Equatorial lowlands. In the case of Colombo, which is on latitude $7^{\circ} 1' \text{ N.}$, it occurs just after the two periods of overhead sun. Jakarta has a rainfall of 70.8 in. with a maximum of 12.5 in. in February and a minimum of 2 in. in August. Note that it is situated on latitude $6^{\circ} 13' \text{ South}$ and that the maximum occurs not long after the sun has passed overhead on its apparent northward journey whilst the minimum is at the season when the angle of midday sun is nearly at its lowest. At Sandakan in Borneo there is an annual rainfall of 120 in., the wettest month being January (18 in.) and the driest, April (3.5 in.). Throughout the region, in common with other Equatorial lowlands, there is usually a severe thunderstorm in mid-afternoon.

All the places quoted are at sea-level but the area contains many mountain ranges and plateaux. On these, of course, the rainfall is very much heavier and the temperature lower, e.g. on the highlands of Java and Sumatra there are quite extensive areas where the average temperatures remain below 64° throughout the year.

CLIMATIC STATISTICS

Station	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann. Rain.	Range of Temp.	Height above S.L.	Type	
1 Singapore	C.	26	27	27	28	27	27	27	27	26	26	26	26	2	2	S.L.	
	° F.	78	79	80	81	82	81	81	80	80	79	79	79	4	4		
	Rain.	8.5	6.1	6.5	6.9	7.2	6.7	6.8	8.5	7.1	8.2	10.0	10.4	109.3	2	2	
	° C.	26	27	28	28	27	27	27	27	27	27	27	27	2	4	4	
	° F.	79	80	82	83	82	81	81	81	81	80	80	80	4	4	4	
	Rain.	3.5	3.8	4.6	10.2	13.9	8.3	5.6	4.9	6.2	13.9	12.8	6.9	92.6	5	5	
2 Colombo	C.	24	24	26	28	29	28	27	26	26	26	28	26	24	24	10	S.L.
	° F.	75	75	78	82	85	82	80	79	79	81	79	76	76	10	10	
	Rain.	0.1	0.0	0.1	0.0	0.7	20.6	27.3	16.0	11.8	2.4	0.4	0.0	79.4	22	22	
	° C.	14	17	23	30	33	33	30	29	29	26	20	11	11	41	41	
	° F.	58	62	74	86	92	92	86	84	84	78	68	51	51	650'	650'	
	Rain.	1.0	0.6	0.7	0.3	0.7	3.2	8.4	7.4	4.4	0.4	0.1	0.4	27.7	12	12	
3 Bombay	° C.	18	21	26	29	30	29	28	28	28	27	22	18	18	21	21	S.L.
	° F.	65	70	79	85	86	84	83	82	83	80	72	65	65	58.7	58.7	
	Rain.	0.4	1.1	1.4	2.0	5.0	11.2	12.1	11.5	9.0	4.3	0.5	0.2	0.2	58.7	58.7	
	Monsoon	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	Monsoon	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	

All the temperatures are actual, i.e. have not been reduced to Mean Sea-Level.

CLIMATIC STATISTICS—*continued*

Station	Temperature											Height above S.L.	Range of Temp.	Type		
	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.					
6 Hong Kong	°C.	16	14	17	21	25	27	28	27	24	21	17	14	S.L.	Monsoon	
	°F.	60	58	63	70	77	81	82	81	76	69	63	24			
	Rain.	1.4	1.7	2.9	5.6	12.7	16.4	12.4	14.3	9.5	4.5	1.5	1.0			
	°C.	24	25	27	27	30	32	31	30	31	28	26	25			
7 Aden	°F.	76	77	79	81	86	69	88	86	87	82	79	77	S.L.	Hot Desert	
	Rain.	0.3	0.2	0.7	0.3	0.2	0.0	0.0	0.0	0.1	0.2	0.0	0.1			
8 Jacobabad	°C.	14	17	23	29	34	37	35	33	32	26	19	15	S.L.	350'	
	°F.	57	62	74	85	94	98	95	92	89	79	67	59			
	Rain.	0.3	0.3	0.2	0.2	0.1	0.2	0.1	1.2	1.2	0.2	0.0	0.1			
	°C.	8	9	11	15	21	24	27	28	24	19	14	12			
9 Smyrna (Izmir)	°F.	46	48	51	59	69	76	81	82	75	66	58	52	S.L.	East Mediterranean	
	Rain.	2.8	2.6	3.2	1.1	0.9	0.4	0.0	0.4	0.5	0.8	3.4	3.7			
10 Damascus	°C.	13	13	14	18	23	27	27	27	26	23	18	14	S.L.	2,900'	
	°F.	55	55	58	65	73	80	80	80	78	73	65	58			
	Rain.	2.0	2.0	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	4.0	14.0		1

CLIMATIC STATISTICS—*continued*

Station	Lat.	Long.	Alt.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann. Rain.	Range of Temp.	Type
11 Tcherni	° C.	1	6	9	16	22	27	29	28	25	19	11	6	28	Iran 11	
	° F.	34	42	48	61	71	80	85	83	77	66	51	42	51		
	Rain.	1.2	0.9	2.4	0.9	0.4	0.0	0.4	0.0	0.1	0.1	1.2	1.3	8.9		
	° C.	-7	-6	0	9	18	23	25	23	17	10	3	-3	32		
12 Astrakhan	° F.	19	27	32	38	43	54	73	77	74	63	50	37	26	58	Turan 12
	Rain.	6.8	9.3	0.4	0.5	0.7	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.5	5.9	
	° C.	-19	-17	-10	-1	7	15	19	16	9	0	-11	-17	38		
	° F.	-3	1	14	30	45	59	67	60	48	32	11	1	70	230'	
13 Tomsk	Rain.	1.1	0.8	0.8	0.7	1.5	2.7	2.9	2.3	1.4	2.3	1.4	1.9	19.8	Prairie 13	
	° C.	-13	-10	-1	8	16	22	25	24	16	9	-2	-10	35		
	° F.	8	14	30	47	60	71	77	75	61	48	29	14	69	450'	
	Rain.	0.2	0.2	0.6	1.0	2.4	3.2	6.7	4.3	2.6	1.7	0.5	0.2	23.5		
14 Shenyang (Mukden)	° C.	-8	-7	-1	6	10	14	17	16	12	6	0	-6	25	Tibet 15	
	° F.	17	19	31	43	50	58	63	61	54	43	32	22	46		
	Rain.	0.3	0.4	0.2	0.2	0.3	0.2	0.5	0.5	0.5	0.2	0.0	0.2	3.2		

All the temperatures are actual, *i.e.* have not been reduced to Mean Sea-Level.

CLIMATIC STATISTICS—*continued*

Station	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Ann.	Range	Height	Type
													Rain.	of	above	S.L.
16 Kashgar	°C.	-6	1	8	16	21	25	27	24	21	13	4	-3	21	4,200'	Temperate Desert
	°F.	22	34	47	61	70	77	80	76	69	56	40	26	58		
	Rain.	0.3	0.0	0.2	0.2	0.8	0.4	0.3	0.7	0.3	0.0	0.0	0.2	3.5		
17 Verkho- yansk	°C.	-51	-44	-31	-14	2	12	16	14	8	1	-6	-12	67	650'	
	°F.	-59	-47	-24	7	35	54	60	57	47	34	22	11	119		
	Rain.	0.2	0.1	0.0	0.1	0.2	0.5	1.2	0.9	0.2	0.2	0.2	0.2	3.9		
18 Vladivos- tok	°C.	-15	-11	-3	4	9	14	19	21	16	9	-1	-10	36	S.L.	
	°F.	5	12	26	39	49	57	66	69	61	49	30	14	64		
	Rain.	0.1	0.2	0.3	1.2	1.3	1.5	2.2	3.5	2.4	1.6	0.5	0.2	14.7		
19 Tokyo	°C.	3	3	7	12	16	21	24	26	22	16	10	5	24		
	°F.	37	38	44	54	61	69	75	78	72	61	50	41	41	S.L.	
	Rain.	2.0	2.6	4.3	5.3	5.9	6.3	5.6	4.6	7.5	7.2	4.3	2.2	57.9		
20 Shanghai	°C.	3	4	8	13	18	23	27	27	23	17	11	6	24		
	°F.	38	39	46	56	65	73	80	80	73	63	52	42	42	S.L.	
	Rain.	2.2	2.3	3.4	3.8	3.7	6.5	5.5	5.9	4.7	3.2	1.7	1.2	44.0		

All the temperatures are actual, i.e. have not been reduced to Mean Sea-Level.

Natural Vegetation.—A hot humid atmosphere is, as all gardeners know, the most favourable for plant growth. Combine this with an extremely fertile soil and you have the "optimum" conditions. There are many types of soil in these Equatorial areas—alluvial or volcanic in the main—and they all contain a considerable amount of humus. This is inevitable in a forested region because of the steady accumulation of decayed vegetable matter—fallen leaves, dead trees, etc. Heat, moisture, bacteria, and insects contribute to extreme rapidity of decay. As a result there is not only a luxuriance of vegetation unparalleled in any other type of region in the world (except in certain monsoon forests where the rainfall is heavy) but also a tremendous variety of types of plant life. This variety is an economic disadvantage because valuable timber rarely appears in "stands" but is scattered about amongst masses of valueless material. There are usually three "layers" of trees. First, there are the giants of over 100 ft., then come those of medium height (60 ft.-80 ft.), and finally the shorter ones of about 30 ft. They are bound together by cable-like creepers (lianas) and the intervening spaces are filled with masses of undergrowth. Germination and growth are so rapid that a track cleared with great difficulty will disappear in a very short time unless constant work is put into maintaining it. Owing to the lack of seasonal climatic variations, there is no special seed or harvest time. Trees bear flowers, unripened and ripened seeds, at the same time and all the time.

These conditions apply to the coastal lowlands, but as the mountains are climbed the forest remains thick owing to the heavy rainfall. This mountain rain forest has not such a variety of types because as the temperature decreases with altitude nature becomes more selective.

(2) THE MONSOON LANDS. *Climate.*—Over the vast area which we have included under this heading there is, of course, a great variety of local conditions. There are, however, certain major characteristics which are common to the whole of the area. The word "Monsun" means "seasonal wind" and monsoon regions are those which have exactly opposite winds in summer to those which blow in winter. They occur where land-masses in temperate latitudes border tropical seas,

e.g. over Asia the pressure is very high in winter, whereas over the warmer tropical sea the relatively high temperatures cause low pressure. So the air flows from land to sea and the monsoon lands experience drought. In summer, on the other hand, the very high temperatures over North-West Pakistan cause the development of a powerful low pressure system, but over the Indian Ocean the relatively cool temperatures give rise to high pressure. As a result air flows strongly from sea to land and the monsoon lands have their rainfall. It is important to understand that the change does not come suddenly. At the equinoxes there are two short seasons with very unsettled conditions, especially in coastal areas where land and sea influences are most in conflict. It is then, especially at the autumn equinox, that the very violent cyclonic storms, typhoons, sweep across the Bay of Bengal and the South China Sea.

The variety of conditions which we have mentioned is connected with the amount of rainfall and the winter temperatures. In India, for example, the mean annual rainfall of the monsoon area varies from about 10 in. in the north-west to 430 in. on the southern slopes of the Khasi Hills of Assam. As to winter temperatures, they range from 10° C. (30° F.) in the Punjab to over 25° C. (77° F.) in southern Burma.

For our specimen climatic station we have selected Bombay. Note especially the sudden jump in rainfall from 0.7 in. in May to 20.6 in. in June. Other places with similar conditions are: Rangoon with 99.6 in. of rain, 21.5 in. in July; Calcutta with 58.7 in., July 12.1 in.; Hong Kong, 83.4 in., 16.4 in. in June. In the lower rainfall group we have Delhi, annual rainfall 27.7 in., 8.4 in. in July; Lahore, 20.5 in., 6.7 in. in July; Mandalay, 35.1 in., 5.7 in. in May; Hyderabad (Deccan), 35.6 in., 7 in. in September. At the other extreme there is Cherrapunji (Assam) with 432 in., 99.6 in. in July, the wettest place in the world, and Mangalore (South-West India), 125.7 in., 37 in. in July.

Natural Vegetation.—As the monsoon lands are so densely populated a natural vegetation map does not convey a very accurate idea of the existing conditions. It only attempts to show what the vegetation would be if man had not felled much of the forest and ploughed up the grassland. With

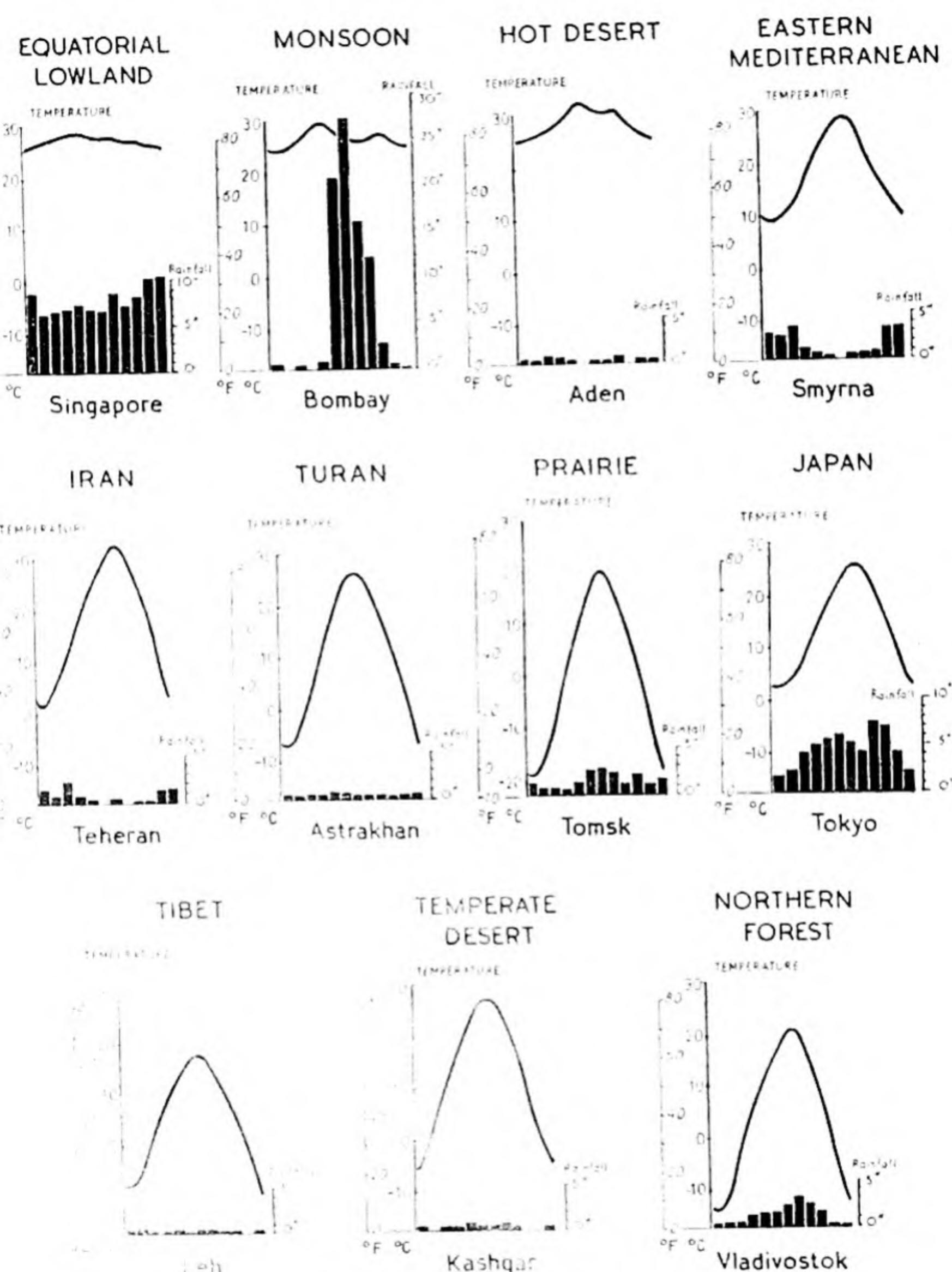


Fig. 11. CLIMATIC GRAPHS.

such great variations of soil, altitude, and above all, of rainfall, it is not possible to speak of a monsoon vegetation except in so far as to say that the greater part of the area is naturally covered with forest of one kind or another. Thus the lower Ganges Basin and the coastlands of Burma and Indo-China have a dense jungle very similar to that of the Equatorial lowlands, with much mangrove swamp along the shores. Very little of the original forest is left in the first-named area for most of it has been cleared for rice-fields. In Bengal trees are even being planted as future fuel supplies to replace cow-dung now so much needed as manure after many years of cultivation. The North-Eastern Deccan and most of the Ganges Basin together with the interiors of Burma and Indo-China have a much more open type of forest, a very characteristic tree of the lowlands being teak. On the uplands of the Deccan the banyan is quite common. It is able to withstand the winter drought by reason of its branches taking root in search of moisture. It is like the bao-bab of the Sudan, a similar summer rainfall region. In North-Western India, the Central and Southern Deccan, the rain-shadow valleys of Burma and Indo-China, there is scrubland or semi-desert vegetation with drought-resisting acacias and tamarisks. On the high mountain ranges, of course, there are belts of vegetation in accordance with altitude, ranging from dense rain forest on the lower slopes, through forests of gaily flowering rhododendrons, camelias, and magnolias followed by pine forests and then by meadows of Alpine mosses and lichens culminating in ice-desert.

(3) THE OLD WORLD DESERT. *Climate*.—The area of the Lower Indus Basin, most of which is composed of the Thar Desert, has in summer a very low average atmospheric pressure. Indeed, in July it is as low as 29.4 in. which is the lowest average pressure for any part of the world at any time of the year. Low pressure means rising air, so that from all the surrounding regions of land and sea alike, other surface air moves in from high pressure belts to take its place. In its turn this new supply of air becomes heated and rises, and so the process goes on. Owing to the rotation of the earth, this inward moving air does not flow straight towards the low pressure centre, but makes its way gradually in ever-narrowing

circles in an anti-clockwise direction. This is an illustration of Ferrel's Law which states that all moving fluids are deflected towards the right in the northern hemisphere and to the left in the southern. The explanation for this may be put simply as follows: the earth makes one revolution around its own axis in twenty-four hours, but, as the earth is spherical, a point nearer the Equator has to travel through space at a much faster rate than those in higher latitudes where the circumferences of the parallels of latitude are less. To take definite examples—the circumference of the earth at the Equator is 24,500 miles, whereas at the Tropic it is about 18,000 miles. At the former, a point travels through space at just over 1,000 miles an hour, but at the latter a point travels at about 750 miles an hour. Now when a particle of air or water begins to move northwards in the northern hemisphere it passes from more rapidly moving to more slowly moving latitudes, but it tends itself to retain the speed of its original latitudes. Therefore, instead of moving along a meridian of longitude, it turns gradually to the right. It will be seen that if this process continues, the particle will tend to describe a circle, for in the second half of its journey it will begin to turn back towards the Equator and so travel towards latitudes moving more rapidly. Its deflection will still be towards the right. In the case of the Thar low pressure centre, our particle of air is affected by two influences—the rotation of the earth and the centre of low pressure. The latter tries to pull it in, but the former deflects it to the right all the time, so that it moves in an anti-clockwise circle. By the time that the flow of air reaches the low pressure centre it has passed over much land and has therefore lost its moisture. This accounts for the summer drought of the Thar. As Arabia is to the west of the low pressure, its winds are northerly, so that they have blown across much of the land-mass and are also dry. In the winter there is high pressure over much of the Asiatic land-mass so that the air flows from land to sea and the desert area shares in the general drought.

An examination of the figures for Aden reveals that most of the very small amount of rain falls in the late *winter* when the temperatures are lowest and the pressure highest. This is caused by local storms, as may be seen from the fact that on the neighbouring Jebel of Yemen there is a *summer* rainfall of



RACIAL TYPES

ABOVE. *Left*, Turkish Landowner.
(Keystone.)

Right, Korean Farmer. (Exclusive N. A.)

B BELOW. *Left*, Bedouin. (Exclusive N. A.)

Right, Moro. (Exclusive N. A.)



Randi

ABOVE

BETWEEN

LOWE
LOWE

LOWE (LOWE, N.Y.)

LOWE (LOWE, N.Y.)

just over 10 in. At Jacobabad in the north-west corner of the Thar Desert there is an annual rainfall of 3.8 in., mainly occurring in July and August. This very light rainfall is a characteristic of the deserts, very few areas being completely without rain. When rain does fall it usually comes as a torrential downpour, being caused by local thundery conditions. Indeed, this occasional rain often does more harm than good, causing the wadis to be filled with violently rushing water and sweeping away the meagre barley crops. Frequently places are affected by such a storm only once in a few years so that an average rainfall of 3 in. may be arrived at by including one storm yielding, say, 10 in., the remainder of the period being absolutely dry.

One is apt to think of these deserts as permanently hot, and this impression tends to be confirmed if one consults a climatic chart. This, however, usually confines itself to giving only the mean average temperatures and thereby conceals a most important characteristic of the climate—the great diurnal range of temperature. For example, at Jacobabad it averages about 27 C.^o (80 F.^o) for most of the year. Voyagers along the Red Sea experience a practical illustration of this at sunset, for the temperature suddenly falls appreciably and the unwise expose themselves to the risk of chills if they do not immediately put on warmer clothing. The climatic feature is caused mainly by the fact that deserts consist of polished sand particles and hard rock face so that during the daytime the sun's rays are radiated immediately, causing very high air temperatures. The mean maximum temperature, e.g. at Jacobabad in August, is 45° C. (113° F.). At sunset, however, as there is no stored heat, the thermometer falls quickly. A contributory factor is the absence of cloud which results in the heat-rays being dispersed throughout the atmosphere instead of being retained in the lower layers. Thirdly, there is the absence of vegetation.

Another characteristic of the desert is the sand storm. This is caused by sudden local changes of pressure setting up vigorous air displacement. Once set in motion the air gathers speed, for in the deserts there are few relief barriers to check its progress.

Natural Vegetation.—As in most other parts of the world the Arabian and Thar Deserts have only small proportions of their areas absolutely devoid of vegetation. In Arabia the true desert extends along a narrow belt through the centre of the peninsula widening out in the south to form the Rub'al Khali or Great Stony Desert. Surrounding this there is semi-desert country, mainly with tufts of coarse grass amidst the sand and with quite frequent oases, especially in the south-west. The latter usually support date palms. In the Syrian Desert to the north-west there is a strange type of sporadic vegetation. After a storm, which may come to a locality only once in ten years, the ground is literally carpeted with dwarf plants—the manna of the Bible. These germinate, blossom, seed, and die all in a few days, for the porous soil soon dries out, and this hurried life-cycle is their only way of preserving their species.

(4) THE MEDITERRANEAN SHORELANDS AND THE MESOPOTAMIAN TROUGH. *Climate.*—This region may be said to experience an East Mediterranean climate for, although it has the typical winter rainfall, there are several features which distinguish it from the true Mediterranean. Thus, the range of temperature is greater because the land-mass influence is stronger than the sea influence. For example, whereas coastal places in the West Mediterranean have an average annual range of temperature of 14 C.° (25 F.°), that at Smyrna is 20 C.° (36 F.°). Inland, of course, the range increases, e.g. at Baghdad it is 25 C.° (45 F.°). Not only is the rainfall less, but also the summer drought is more complete. In the East Mediterranean area, average pressure is highest in winter as is the case further west. The rainfall is caused by the irregular passage of low pressure systems which enter the Mediterranean through the Gate of Carcassonne and the Gibraltar Strait. Sometimes these depressions penetrate to the Mesopotamian Trough and even along the Persian Gulf. It is the light rainfall from these which entitles us to include Mesopotamia in this region. The annual rainfall at Baghdad is 0.6 in. and it occurs from November to April.

Natural Vegetation. Forming a narrow fringe round the shorelands of the Black Sea and Eastern Mediterranean there is a continuation of the belt of typical evergreen shrubs and

trees. Some of the hills, notably the Lebanon Mountains of Syria, had a natural forest cover until man removed such trees as the famous cedars for building purposes or allowed goats to kill others, as happened in Cyprus. Much re-afforestation work has been carried out, *e.g.* the Balfour Forest of Israel. All sorts of drought-resisting devices have been developed. Plants are long-rooted to reach the moisture in the sub-soil; they have developed long, narrow leaves with thick wax-covered skins. These leaves are fleshy and contain cells for moisture storage for use during the summer drought. This accounts for the evergreen nature of Mediterranean vegetation. Many of the plants are rich in oil and give off powerful aromas when touched or when the leaves are crushed. The myrtle is a good example of this. Seeds are often protected by oily or juicy fruits. Indeed, the most characteristic plant, the olive, is well represented, *e.g.* on the Mount of Olives, Israel.

(5) IRAN, ANATOLIA, AND AFGHANISTAN. *Climate*.—Here again the "Mediterranean" influence is evident, for there is a definite winter rainfall maximum, *e.g.* at Teheran in Iran, of a total rainfall of 9 in., 7.9 in. falls in the six months November-April. At Kabul in Afghanistan the annual rainfall is 13 in. and of this over 11 in. falls from November to April. In this region, however, the range of temperature is greater. At Teheran it is 28 C.° (52 F.°) [1° C. (33° F.) January, 29° C. (85° F.) July]; at Kabul it is 25 C.° (46 F.°) [-1° C. (30° F.) January, 24° C. (76° F.) July]. Another characteristic is the great diurnal range in the summer months—17 C.° (30 F.°) at Teheran and 18 C.° (32 F.°) at Kabul.

Natural Vegetation.—The characteristic vegetation of this region is the coarse grass of the High Steppe and the salt bush of inland drainage areas, known in Iran as the Dasht, with patches of true desert.

(6) TURKISTAN. *Climate*.—In Central Asia, in the lowland extending from the Caspian to the foothills of the Pamir Plateau, there is an area exposed to the north and screened from the south. The figures for Astrakhan, just outside Asia on the Caspian shore, give a very fair idea of the climatic conditions. Note especially the severity of the winters compared with the heat of the summers. The precipitation

is light but the summer rainfall (April-September) is in the ratio of 1.73 to 1 to the winter snowfall. In winter, bitterly cold north-east winds bring fine snow.

Natural Vegetation.—Although there are patches of true desert, notably in the Kizil Kum and Kara Kum to the south of the Aral Sea, the greater part of the region is covered with poor steppe. In the area below sea-level to the south and south-east of the Caspian, there is much salt bush, which absorbs salt in solution through its roots and exudes it on its leaves which glisten in the sunshine.

(7) THE ASIATIC STEPPES. There are two regions which may be included under this heading:—

1. The famous Kirghiz Steppe which extends in a belt from west to east with its axis along latitude 50° N. and which is continued to the north-east, in the Upper Ob and Yenisei Basins, by an area of mixed forest and grassland. The Canadians call a similar tract to the north and east of their prairies, the Grove Belt.

2. The West Manchurian lowland.

Climate.—The first of these regions is far removed from the sea influences and so experiences great extremes of pressure between midsummer and midwinter, e.g. at Barnaul this varies between 30.45 in. in January and 29.75 in. in July. This variation is mainly caused by the corresponding temperature changes because the annual range of temperature is about 38 C.° (70 F.°) i.e. from about -18° C. (0° F.) in midwinter to about 20° C. (68° F.) in midsummer. The rainfall is predominantly a summer one, e.g. Barnaul has 70 per cent. of its 14 in. in the period May-October; Tomsk 66 per cent. of its 19.8 in., and Semipalatinsk 63 per cent. of its 7.3 in. in the same period. This summer rainfall is caused by the penetration of westerlies from the Atlantic. In the winter the chief precipitation is snowfall occurring in the autumn half. In this region temperatures often fall far below the average in mid and late winter, when north winds bring blizzards of fine powdery snow.

In Manchuria the extremes of temperature are equally great, e.g. at Shenyang they range from -13° C. (8° F.) in January

to 25° C. (77° F.) in July, and at Harbin from -19° C. (-2° F.) in January to 22° C. (72° F.) in July. The rainfall is, of course, heavier than that of Central Asia and the summer proportion is even higher, *i.e.* 78 per cent. of about 24 in. That is because south-east winds are drawn into the land-mass owing to the low pressure over the interior. The moderate rainfall is caused by the enclosed nature of the lowlands, because they are in the rain-shadow of the Korean Highlands. The winter drought is caused by the reversal of pressure and winds so that they are now off shore.

Natural Vegetation. The low winter temperatures, the heat of summer, the moderate rainfall, and the light soils combine to prevent tree growth so that the temperate grassland predominates. Along the southern edge of the Kirghiz the grass merges gradually into semi-desert. In the north-east trees gradually make their appearance, forming a transition between the Steppe and the northern forests. In the west of Manchuria, where the land rises towards the Khingan Range, there is also a belt of semi-desert caused by the porous nature of the loess soil.

The temperate grasslands are at their best in spring when the melting of the snow and the coming of the early rains combine to moisten the soil. Fresh green blades of grass are mingled with myriads of flowers. In the heat of summer the green gives way to brown as the grass becomes parched.

(8) TIBET. The great plateau of Tibet, bounded to the north by the Altyn Tagh and to the south by the Himalayas, opens to the east into series of parallel ranges and deep valleys. The plateau averages 14,000 ft. above sea-level and none of the valleys falls much below 12,000 ft.

Climate.—On the exposed plateau the winters are bitterly cold and icy snow-laden winds make the plateau impossible to cross. Even in summer, conditions are not much better. In the valleys, however, there is greater shelter and, as the figures for Leh show, the summers are pleasantly warm. Note the low rainfall. On the high fold ranges the snow comes chiefly in summer, the winters being cold and dry. This summer snowfall is, of course, caused by the inflowing monsoon winds rising up the mountain slopes.

Natural Vegetation.—Over the greater part of the plateau, the vegetation is akin to that of the tundra with much moss and lichen, although in the north-east round the high lake, Koko Nor, there is an extensive tract of marshland. On the surrounding mountains and along the high ranges which cross the plateau tundra gives way to ice-desert.

(9) THE GOBI DESERT AND THE TARIM DEPRESSION.

Climate.—Lower in altitude but higher in latitude than the Tibetan Plateau, this region is equally cold in winter but has a deficiency of rainfall. In the extreme west of the Tarim Basin, Kashgar has a January temperature of -6° C. (22° F.) and a July one of 27° C. (81° F.), whilst in the north-east Ulan-Bator (Urga) varies from -26° C. (-15° F.) to 17° C. (63° F.). Kashgar's rainfall is 3.5 in., almost all of it in summer.

Natural Vegetation.—Much of Mongolia consists of the Gobi or Shamo Desert and there is also true desert in the centre of the Tarim Depression. In Northern Mongolia there is enough rain to support coarse grass. It was from this region that the Mongol horsemen swept into Europe and China, and it is still inhabited by nomadic horse and cattle men. Around the edge of the Tarim Basin there are frequent oases of good grass watered by streams from the surrounding mountains where there is a higher rainfall and where there are, in some cases, glaciers.

(10) THE SIBERIAN FORESTS—extending from the Urals to the Pacific Coast.

Climate.—Throughout this area the winters are extremely cold. Indeed, Verkhoyansk, in the north-east on the edge of the forest, is known as the winter North Pole of Cold because it is the coldest place in the northern hemisphere with a mean January temperature of -51° C. (-59° F.). With a summer temperature of 16° C. (60° F.) it has the greatest known range of temperature 66° C. (119° F.). Although other places are not so cold as Verkhoyansk, they are cold enough. Irkutsk, in the extreme south, has a January temperature of -21° C. (-5° F.) and a July one of 18° C. (65° F.). Vladivostok, on the south-east coast, has a January temperature of -15° C. (5° F.) and an August one of 21° C. (69° F.). Okhotsk, on the north-east coast, has

a January temperature of -23° C. (-10° F.) and a July one of 13° C. (55° F.). Rainfall is moderate throughout the area and occurs mainly in summer, e.g. at Verkhoyansk it is only 5 in., of which 3 in. fall in June, July, and August. At Vladivostok it is 22.5 in., of which 17.5 in. fall in the period from May to October. At Irkutsk it is 15 in., with 10.5 in. between May and October. The winter precipitation is, of course, mainly in the form of snow which averages about 3 ft. at Irkutsk and a great deal more in the north-western regions. A feature of the climate is the great diurnal range of temperatures, especially in the spring, e.g. at Verkhoyansk in April the range is 20° C. (86° F.). This is because the sun's rays begin to make themselves felt in the day-time but the still frozen earth quickly cools the air at night.

Natural Vegetation.—Only very hardy vegetation can stand up to these conditions. Most of this vast area is covered with a forest of small coniferous trees, but the actual composition of the forest varies from west to east. From the Urals to the Yenisei the fir, spruce, larch, and pine trees are interspersed with a great deal of marshland, in which there are large areas of dead trees. From the Yenisei to the Pacific the forest is more continuous. The difference is mainly due to the geology, for the boulder clay of the western half is more favourable to the development of marshland than the hard rock of the eastern. In the extreme east where the rainfall is heavier and the winters are mild the vegetation is more mixed, for amongst the conifers there are patches of such deciduous trees as the oak and the elm, the maple and the walnut. The conifers adapt themselves to the winter cold in several ways. They have long roots below the frozen top soil, their bark is thick to protect the sap which circulates throughout the year. They are evergreen, their leaves being needle-shaped thus exposing the minimum surface area. The branches of many types slope downwards, which has the advantage of preventing the weight of the frozen snow from snapping them, as happened to many of our own trees in the severe winter of 1962-3.

(11) NORTHERN CHINA AND NORTHERN JAPAN, EASTERN SIBERIA. **Climate.**—This region is very much affected by the alternations of temperature and pressure over the interior.

Indeed, some authorities include much of it in a Temperate Monsoon Climate, but it seems preferable to think of monsoons as confined to tropical areas. As this area has characteristics comparable to those in North-Eastern America we include it in the St. Lawrence type.

The winters are cold because the Asiatic high pressure causes an outflow of bitterly cold air. Mainland areas and those on the west coast of Japan experience much colder conditions than those on the east coast, as a comparison of the figures for Vladivostok (a border line case) and Tokyo will show. This is partly because of the shelter afforded to the latter by the mountain backbone of Honshu, and partly because the Japanese coast is affected by the warm Kuro Siwo current which washes the eastern shores, contrasting with the cold northerly current which flows along the mainland coast. The summers are hot throughout the region. There is a definite summer maximum rainfall. Here again Japanese stations show distinct differences from those on the mainland. The total amount received is greater, and it is more evenly distributed throughout the year.

Natural Vegetation.—Most of the area has been cleared of its natural vegetation, but where it remains it is a close forest of deciduous trees such as the wild cherry of Japan and the mulberry of North-East China and Japan, together with bamboo on the lowlands and conifers on the high ground.

(12) SOUTH-EASTERN CHINA, SOUTHERN JAPAN. *Climate.*—This area experiences much higher summer temperatures than Region 11, and the winters though still cool are noticeably warmer. Compare Vladivostok [January - 15° C. (5° F.), August 20° C. (68° F.)] with Shanghai [January 3° C. (38° F.), July-August 27° C. (81° F.)]. This is, of course, the natural effect of the lower latitude of the latter, but we can still note the influence of the outflow of cold air from the interior in winter. The rainfall is fairly heavy with a pronounced summer maximum. In winter the prevailing wind is north-easterly so that a certain amount of moisture laden air is blown inland, but in summer the wind is directly on-shore from the south-east.

An interesting comparison may be made between the rainfalls of Shanghai and Wuhan. The former, although on the

coast, has only 44 in., and the latter, well up the Yangtse Valley, has 51 in. The former ranges from 2.2 in. in January to 6.5 in. in June, and the latter from 1.5 in. in January to 9.2 in. in June. The differences may be explained by the fact that in winter Shanghai is more affected by the north-east winds, whereas in summer Wuhan, which is in an enclosed valley, is much affected by convectional rainstorms.

Natural Vegetation.—Here again little is left in most parts, but where it is, there is dense sub-tropical forest, particularly on the more sparsely-populated Formosa and such nearby islands as Nan Ko which have a very high rainfall. The bamboo is very common in this area.

(13) THE TUNDRA. A narrow belt along the Arctic shore. *Climate.*—The northern limit of tree-growth is taken to be the 10° C. (50° F.) July isotherm so that all the region to the north of this may be included in the tundra. The summers are on the average cool, *i.e.* under 10° C. (50° F.), but as the region is beyond the Arctic Circle the sun does not set throughout the period March-September so that in sheltered valleys quite high temperatures are recorded at "midday," *i.e.* when the sun is at its highest. The winters are, of course, bitterly cold, varying from -40° C. (-40° F.) in January in the east to -22° C. (-8° F.) in the west. The difference may be accounted for by the influence of the warm North Atlantic Drift and south-west winds. There is much snow in the winter and in summer there is a small amount of rain, usually a drizzle.

Natural Vegetation.—The tundra may be sub-divided into three types according to altitude. First there is the high tundra, consisting of barren rock with only moss and lichen. Next there is the middle tundra, *i.e.* the slope between the hummocky high ground and the river valleys. In some parts this is covered with Arctic grass, a tough kind which withstands the severe winters. There are also stunted little trees not more than a few inches high but with all the features of their larger counterparts. Berry-bearing bushes like the bilberry and the cranberry are common. The low tundra or valleys are frozen wastes in winter, but in summer the top four feet or so of soil thaws leaving underneath to a depth

of about eight feet a belt permanently frozen. Consequently the flat lowlands become marshy. As the rivers thaw in their upper courses first, the water flows down and adds to the flooding. The marshlands are gay in summer with such bulbs as the snowdrop and crocus. One unpleasant feature in summer is the myriads of mosquitoes which rise from the marshlands. Travellers who have visited both the Equatorial lowlands and the Arctic tundra have declared that they found the insects much the more troublesome in the latter.

CHAPTER III

THE PEOPLES OF ASIA

Euro-Asia has been mainly populated by people, in families and tribes, gradually moving outwards from Central Asia. As they moved they came under different climatic and other geographical conditions, and so developed different characteristics of colour, hair, facial features, etc., thus beginning the white, yellow, and black races. We shall find examples of all in Asia. This is one theory, the Dispersal Theory, but other authorities consider that the various races of men developed independently of each other in widely scattered parts of the earth.

By far the most widespread and numerous of the Asiatics are the Mongols or peoples of the yellow race. Their racial home is the semi-desert upland of Mongolia. They are slant-eyed, have high cheekbones, straight black hair, yellow skin, and are, in general, beardless. In the grassland and semi-desert areas of their homeland they are horsemen from a very early age so that they become bow-legged. At intervals during prolonged droughts, or when the population has increased to a greater extent than the country can support, hordes of these Mongols have moved out in all directions. Some have passed through the Dzungarian Gate to the west and making their way along the belt of steppes, have passed through the Ural-Caspian Gate into Europe (e.g. the Huns, Cossacks) or have settled in South-West Asia (e.g. the Uzbeks). Others travelled down the Wei-Ho and Hwang-Ho valley into China to become the "Farmers of Forty Centuries" as F. H. King has called the Chinese. Others ventured overseas to the Japanese festoon of islands where they mingled with other peoples who had made their way northwards along the other island groups. Some climbed the Central Asiatic Highlands and made their way into Burma and Thailand and even into the mountains of Nepal (the Ghurkas). Others ventured through the belt of forests until they reached the

Arctic, when they ranged along the shores to develop into Lapps, Finns, Samoyeds, and Chukches, or after crossing into America, Eskimos and American Indians who penetrated as far south as the island of Tierra del Fuego.



Fig. 12. THE PEOPLES OF ASIA.

All these groups have retained their main physical characteristics of complexion, hair, eyes, but in other ways their appearance has changed. The Japanese are short and wiry because of the hard struggle on an over-populated group of islands. The northern tribesmen are short and fat, for

they, too, have a hard life, but they eat as much fatty food as possible to protect themselves from the cold.

The white race is supposed to have originated in South-

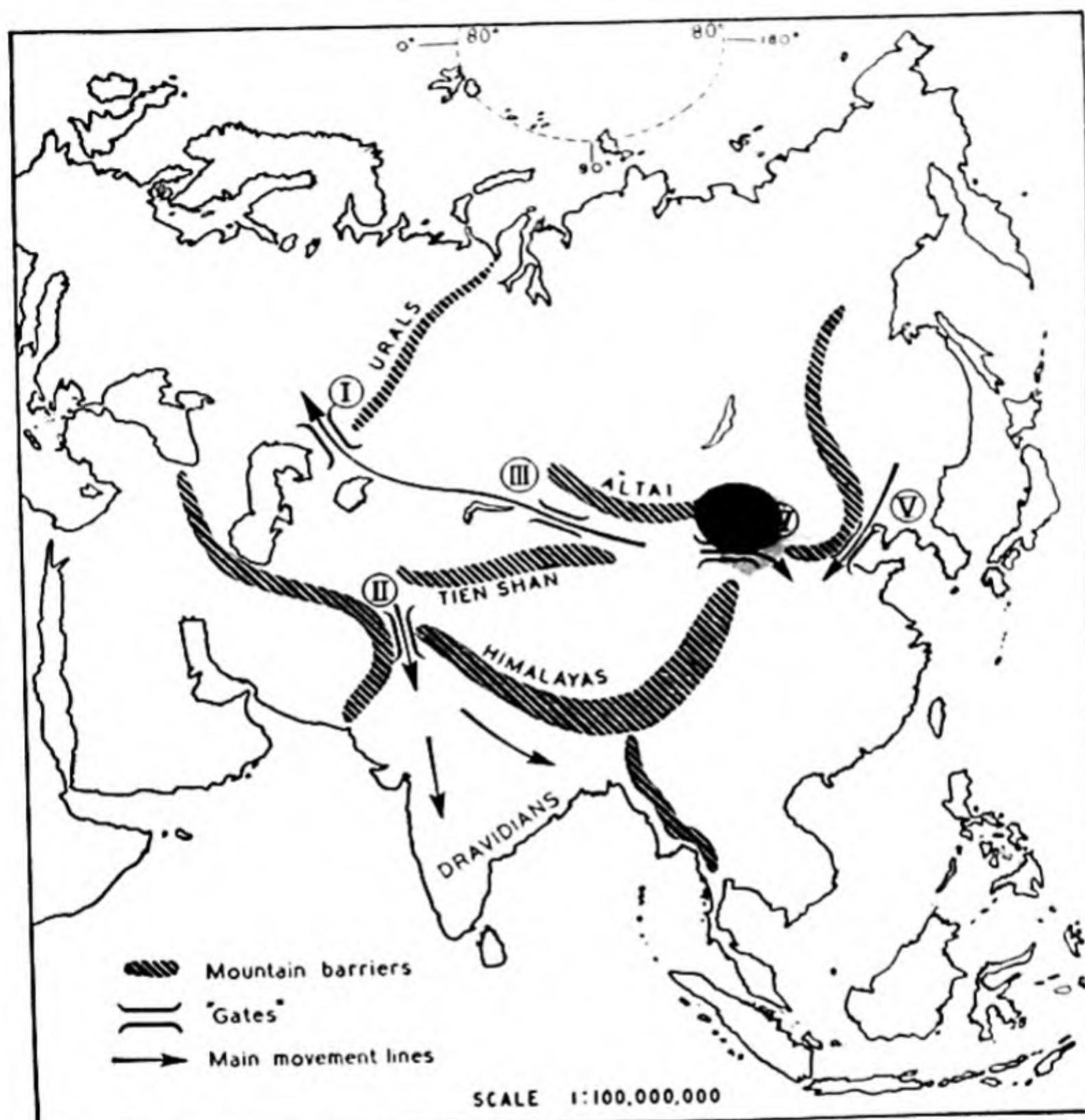


Fig. 13. CHIEF MOVEMENT LINES AND MAIN GATEWAYS.

(I) The Ural-Caspian Gate. (II) The Khyber Pass. (III) The Dzungarian Gate. (IV) The Wei-Ho—Hwang-Ho Valley. (V) The Pei Ping Gate. (I) and (III) were used by Mongols at various times to enter Europe, (II) by the Hindus and Moslems to enter India, and (IV) by the Mongols and (V) by the Manchus to enter China.

West Asia and to have moved outwards. Some, of course, spread across Europe to become in the north-west what has often been termed the "Pink Race." Others moved across Persia and settled there, and a third group moved in two

waves into India via the Khyber Pass. After many generations, their complexions have become very dark so that they are sometimes referred to as of the brown race, but actually they exhibit many of the features of the white race, *e.g.* their fine nostrils and thin lips which distinguish them so much from the negroes.

The latter are represented in India by the Aborigines of the mountainous areas along the northern edge of the Deccan, in Ceylon by the Veddas, by the Sakias of the mountain spine of the Malay Peninsula, and by various tribes in the mountains of Indo-China as well as the people of the Andaman and Nicobar Islands. They were all driven into inaccessible areas by the white race in the case of India and by the yellow race in South-East Asia. The Dravidians were also pushed into Southern India and Ceylon by the Hindus, who in their turn had been forced southwards by the Moslems. The Dravidians are a separate people whose origin is unknown, but they arrived in their present homelands after the Aborigines.

At various times there have been considerable movements of Europeans into Asia, *e.g.* the Russian colonisers along the route of the Trans-Siberian Railway. The armies of Alexander the Great left many colonies, *e.g.* in Persia, and even now one comes across Persians with fair complexions, blue eyes, and long heads as contrasted with the black haired, brown eyed, and round-headed majority. The West Europeans sent many traders and administrators to South-Eastern Asia and mixed marriages produced many Eurasian children. In India these are known as Anglo-Indians (they number about 150,000), and until recently found themselves in an invidious position, although most unfairly, being unaccepted by the British and despised by the Indians. In Bombay they even had their special bathing place. Lately, with the spread of toleration amongst the Hindus, they have been accepted by all grades of society which is a good thing because they should have an important part to play in the development of a country for which they have profound loyalty.

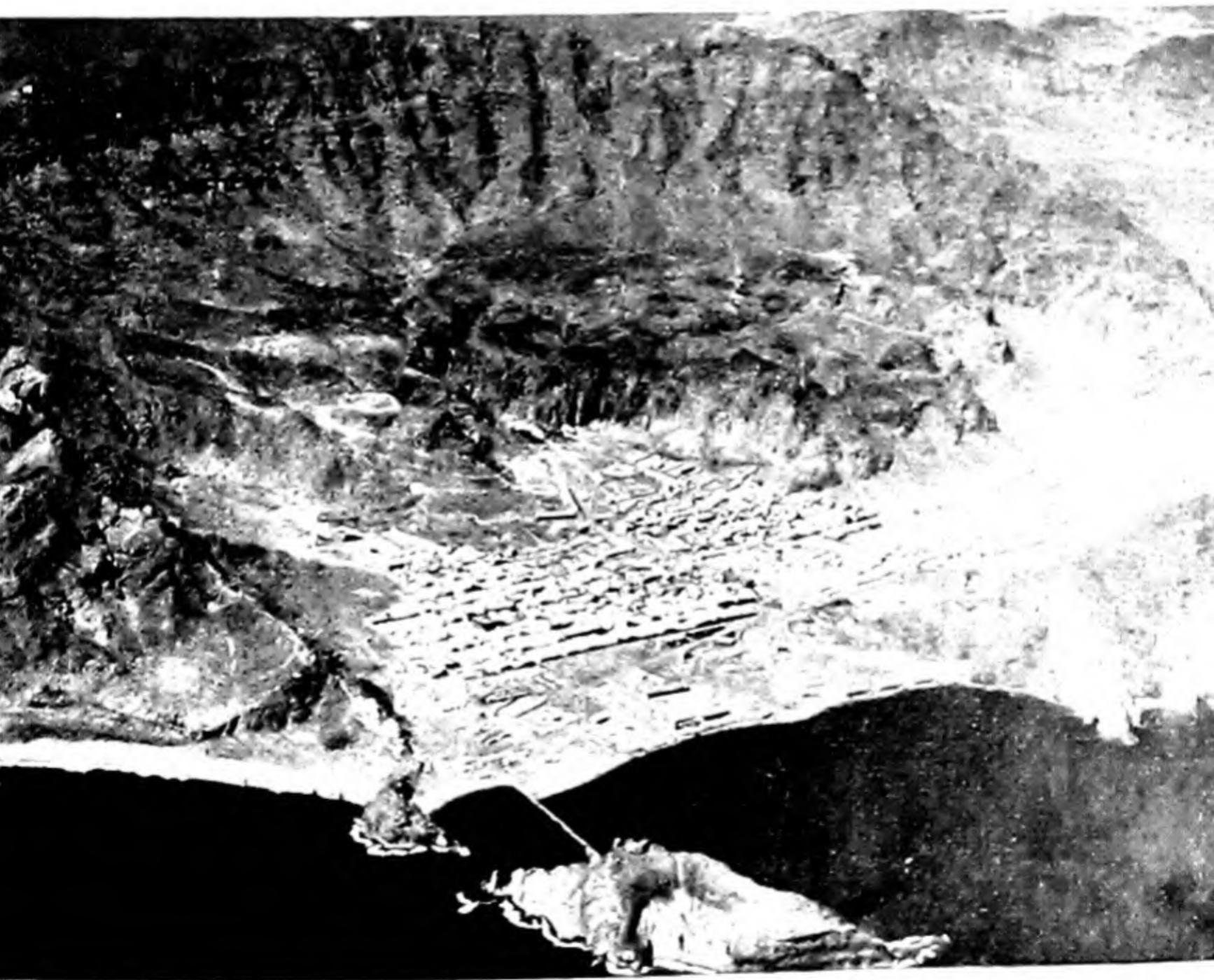
Asia has been the birthplace of all the world's great religions, but, even so, vast areas of the north-east are populated by pagans who follow Shamanism or spirit worship. There are many pagans, too, in the isolated parts of India,

China, and the East Indies, especially Borneo. The chief cradle of religion has been the Arabian peninsula for it is from here that Christianity, Judaism, and Muhammadanism (Islam) has spread. It has been said that shepherds, "watching their flocks by night," and caravan leaders who travel by night to escape the heat, have much time to notice the mysteries of the skies and so it is not surprising that they should speculate on nature and evolve ideas of a supreme creator. A study of the Old Testament will bring this out clearly.

The two other great religions, Brahmanism, or Hinduism, and Buddhism, both originated in India. The former was a logical development from nature worship and retained the idea of a Sun God and the worship of a river, Mother Ganges. This was natural because the inhabitants of the Ganges Valley knew full well that they had to rely on the warmth of the sun and the moisture from the river to grow their crops. The main characteristic of the Hindu religion is the Caste system which is based on the ideas that the soul does not die but enters the body of another creature, and that one must follow the vocation of the caste into which one is born, so as not to interfere with destiny. It has led to aversion to taking life even of animals and to a variety of rules forbidding association of peoples of different castes. Modern conditions of travel and industry will rapidly break this system down. Thus already there have been modifications in the attitude of caste Hindus towards the Untouchables or Outcasts, who live mainly in South-East India and who are now allowed to worship at Hindu temples but at separate times. In November, 1948, the Government of India proclaimed that in future caste should not prevent anybody from following any occupation.

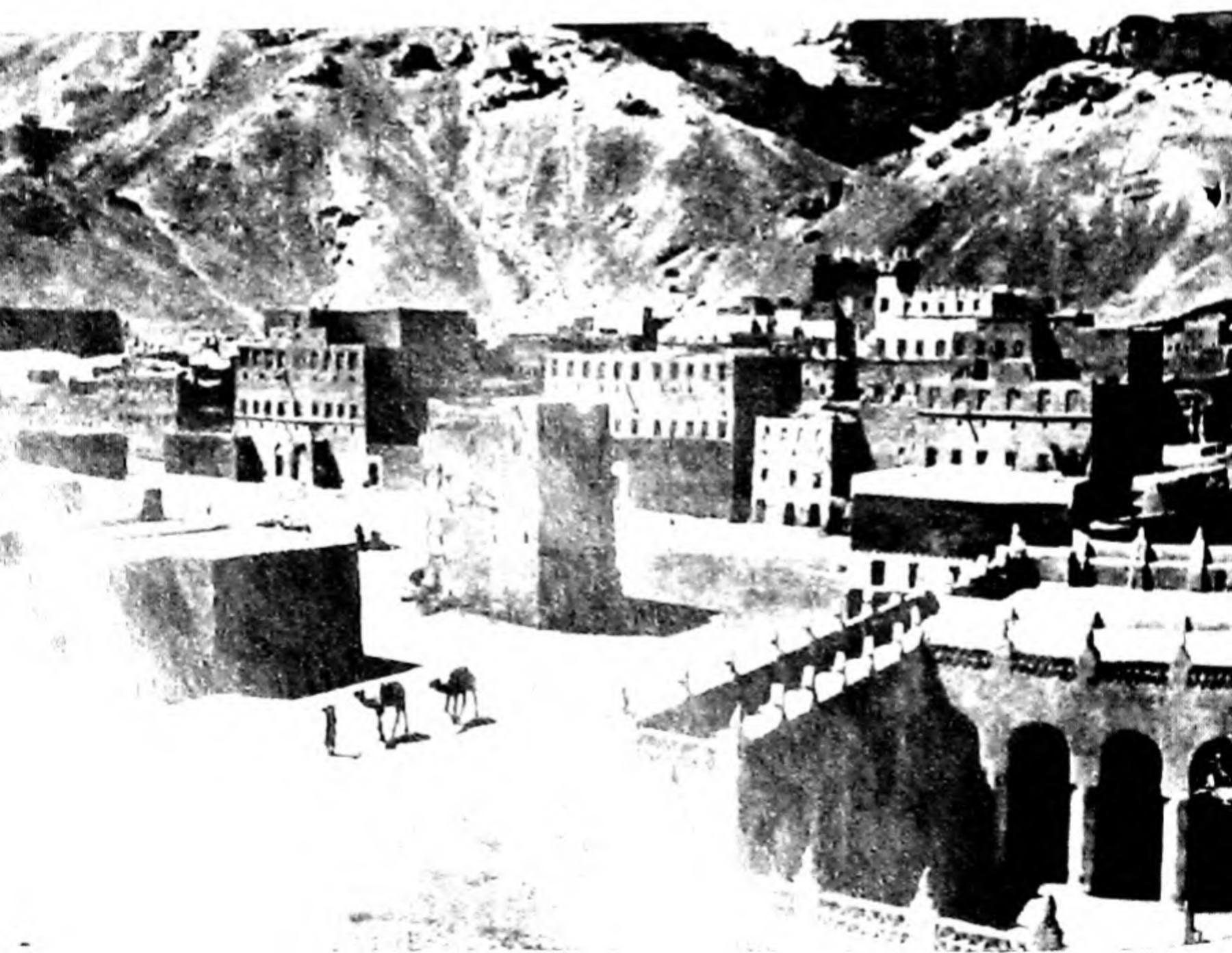
The second great religion to originate in India was Buddhism. Buddha evolved a philosophy of life which was on a much higher plane than that of the Hindus. This horrified the highest-caste Hindus, the Brahmins or Priests, of which he was a representative. Consequently, Buddhism made little progress in India but gained many adherents in Ceylon and amongst the whole of the yellow race of Eastern and South-Eastern Asia. Few of the Chinese or Japanese, however, are pure Buddhists. Buddhism and its variants, like

Japanese Zen, have aroused much Western interest in recent years.



Above: BASRA. AN AERIAL VIEW SHOWING THE STRUCTURE OF ADEN WHICH FORMS PART OF THE PORT. (Exclusive News Agency)

Below: ADEN. AN AERIAL VIEW SHOWING THE CRATER AND STEEP ISLAND. (Exclusive News Agency)



CHAPTER IV

THE NEAR EAST

The area extending from the Black Sea to the Gulf of Aden is often called the "Land of the Five Seas"—a very apt name; the five seas bordering it being the Black Sea, the Mediterranean, the Caspian, the Persian Gulf, and the Red Sea. It is easy to see why it has been such a bridge-land between Asia on the one hand and Europe and Africa on the other, and why it has been such a meeting-place of races and has had such a rich and varied history. Incidentally, the term Middle East is often wrongly applied to this area.

Politically the region includes Anatolia, Iran, Syria, Iraq, Israel, Jordan, Yemen, the Federation of Southern Arabia, the Hadramaut, and Oman, etc. As this covers far too wide an area for a detailed study we deal in this chapter only with general considerations and the details of Arabian lands.

Structurally there are four sub-divisions. In the north there are the great plateaux of Anatolia and Iran, flanked by their fold ranges. Secondly, there is the trough of Mesopotamia, a synclinal lowland. Most of it is composed of fertile alluvium deposited by the Tigris and Euphrates and removed by them from the former region. Thirdly, the shorelands of the Levant consist of the narrow coastal plains of the Lebanon and Israel, backed by the Lebanon Mountains and the plateau of Judea. The Rift Valley forms a great trough from north to south across the area. Lastly there is the Arabian Plateau with its steep, tilted edge facing the Red Sea and a gentle slope towards the Persian Gulf.

Climatically, the whole area has several common characteristics. The summers are hot and dry and there is a deficiency of rainfall except in Mediterranean and Black Sea coastal areas. The rain falls in winter when the temperatures vary considerably according to altitude and position (latitude and distance from the sea), from the bleakness of the Persian Plateau to the heat of Aden (mean January temperatures: Teheran, 35° F.: Aden, 76° F.).

Iraq

This Arab Republic, based on the valleys of the Tigris and Euphrates, became completely independent in 1932, having been under British Mandate since the end of the First World War in 1918. From 1918 it was a Kingdom, but in 1958 a revolution resulted in the formation of a Republic. Like the rest of the Arab lands, it had previously been for some centuries under Turkish rule. During that time nothing had been done to repair the damage done by the Mongols, so that all the ancient irrigation canals had fallen into disuse and the country could support only a fraction of the population which flourished there in the days of Babylon. In an area of 170,000 square miles there are $6\frac{1}{2}$ million people, *i.e.* about 32 to the square mile, and the standard of living is low. Remember that Iraq forms part of the "Fertile Crescent" which extends from the Persian Gulf to Israel. However, at the present time, nearly one-third of the country's revenue, much of it from oil royalties, is being devoted to large-scale projects of irrigation, reclamation, communications, and industrial development.

Disregarding that part of the Syrian Desert which is included along its western boundary, Iraq consists of the riverain lowland of Mesopotamia ("between the rivers"). It is sub-divided into two parts—(a) the north-western, in which the rivers flow in valleys below the level of the surrounding country. Thus, as far as Hit, the Euphrates flows in a narrow steep-sided valley. It is in this part that the Tigris receives most of its tributaries from the Zagros Mountains. Tigris means "the Arrow" and it is much swifter than the Euphrates so that much silt is carried into the lower reaches. Between the rivers is a plateau covered with poor steppeland grass.

(b) From Hit to the Persian Gulf the lower basin has its rivers above the level of the plain, for like most great rivers in their lower courses they have built up embankments with their own silt. In early geological times the whole of the area was under the sea, which gives an indication of the amount of silt which must have been deposited. The process is still going on. The two rivers approach each other very closely near Baghdad, only to diverge again until they finally meet at Basra to form the Shatt-el-Arab, the navigable channel

leading to the Gulf. The plain is threaded by numerous distributaries which lead from one river to the other, thus providing a ready-made framework for irrigation schemes (cf. Riverina of New South Wales, Entre Ríos of Argentina). The very hot summers and the low rainfall (Baghdad—July temperature, 95° F.; rainfall, 6.6 in., in winter) render such irrigation essential for cultivation and much work has already been done towards restoring the system. In the winter, wheat and barley are grown, and in summer over 10,000 acres of cotton, mainly along the Diala River to the north-east of Baghdad. The Derbendi Khan Dam across the river was completed in 1961. It irrigates 1,500 square miles as well as aiding flood control and providing hydro-electric power. About 80 per cent. of the world's dates are produced in Iraq, chiefly along the Shatt-el-Arab between Basra and the sea; the annual production is about 300,000 tons, of which some 130,000 tons are exported. Cement manufacturing is increasing steadily, and is now over 1 million tons a year. Some rice and millet are also grown.

Many sheep and goats are reared on the northern steppes, mainly by Kurds and Assyrians who have descended from the neighbouring mountains of Turkey and Persia. This accounts for the considerable exports of wool, hides, and skins. Before the defeat of Turkey in the First World War, the people were nomadic and used to spend their summers in the mountains, descending to the milder lowlands in the winter. Now that they are unable to do this, they have changed their manner of living in two ways. They live in villages of stone instead of tents and they have taken to cultivating barley, wheat, maize and rice, melons and tomatoes, for their own use, and tobacco for export. In sheltered valleys grapes, mulberries, walnuts, apples, pears, pomegranates, and figs are grown. Methods are very primitive, e.g. wooden ploughs made roughly from forked trees are in common use. Owing to the more settled conditions the numbers of animals have decreased as the area under cultivation has increased. Conditions will be greatly improved when the new dams now being built in the Tigris tributaries, Greater Zab at Bekhme and Lesser Zab at Dohan, are completed. They will prevent flooding and provide irrigation and hydro-electricity.

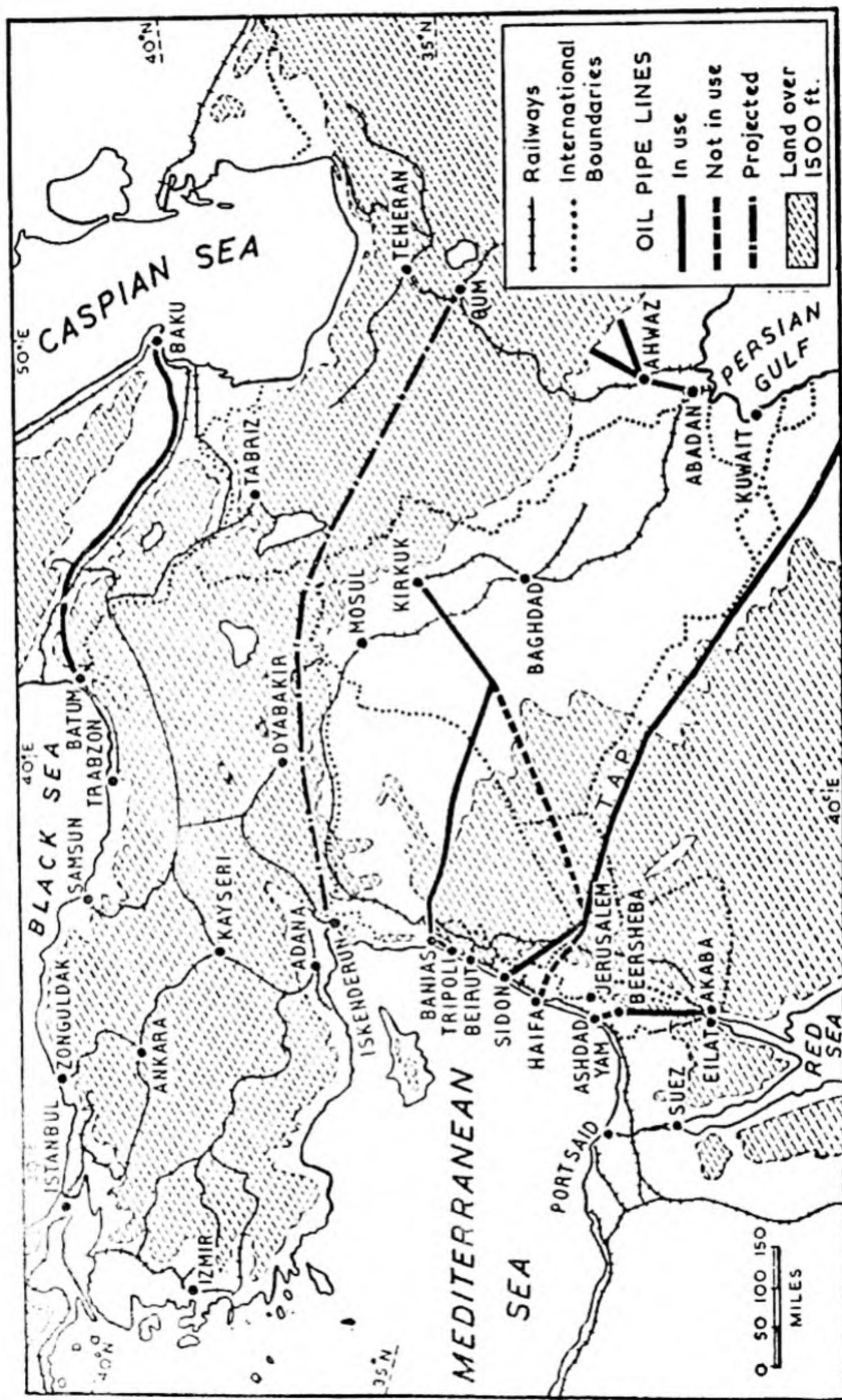


Fig. 14. THE NEAR EAST—RAILWAYS AND PIPE LINES.
The Israeli pipe line from Eilat to Ashdad has now been extended to Haifa.

Bitumen has been used for various purposes since very ancient times. Where it exists there is a sure indication of the presence of petroleum. Indeed, in North-Eastern Iraq there is an important oil-bearing area. Wells are worked in the neighbourhoods of Mosul, Kirkuk, and Khanaqin. Over 35 million tons of oil are exported by pipe line to the Mediterranean ports of Banias and Tripoli. A new oil-field has been developed near Basra. In 1951, Iraq's production of petroleum was 8 million tons. By 1966 it had risen to 62 million tons a year, of which one-quarter comes from the Basra area and is exported from the Fao Terminal at the mouth of the Shatt-el-Arab.

The capital, Baghdad, situated at the point where the Tigris and Euphrates most nearly approach each other, and the Diala and Tigris join, is the chief route centre of the country. It is significant that nearly all the Governments of the area throughout its long history have had their capitals in this region, the only important exception being Nineveh (Babylon, Seleucis, and Ctesiphon are examples). Basra, the port, is the chief commercial centre. About 2½ million tons of shipping use it annually. A new port Umm Qasa is being developed below the Shatt-el-Arab. Because of its key position, the country is well served by airways, being on the main routes from Britain and U.S.A. to India and further east. The giant planes contrast strangely with the small coracles, used to ferry goods across the rivers. These are made of inflated skins, palm fronds coated with bitumen, or basket work. They carry anything from melons to donkeys.

The greatest need of Iraq is the control of the Tigris and Euphrates floods which sweep down annually from Turkey and not only damage the agricultural lands, but endanger Baghdad. Barrages have been built at Samarra on the Tigris and Ramada on the Euphrates to deal with the floods. The money for these works and many others, including roads and railways, has been found from the royalties paid by the Iraq Petroleum Company, which in 1960 were about £100 million.

Arabia

A large proportion of the peninsula is under the control of Saudi Arabia, the chief exception being a belt extending from Yemen in the south-west to Kuwait at the head of the Persian

Gulf. Saudi Arabia has an area of about one million square miles, with a population of approximately 6 million. Again, apart from some coastal areas, it is nearly all desert inhabited by Arabs, rearing camels, sheep, and goats. It consists of a tableland tilted from south-west to north-east. In Oman there is a high ridge, really part of the Persian fold system. In Jebel Akhdar it rises to 9,900 ft. There is, of course, no river system, but there is a series of wadis running into the desert from the hills overlooking the Red Sea. They occasionally run with water after severe storms occur in the hills, but normally the water is under the sand.

The area along the Red Sea coast (apart from the extreme south) is known as the Hejaz. For its prosperity it relies almost entirely on the thousands of pilgrims who annually visit the Muhammadan holy cities of Mecca (200,000) and Medina. Dates are grown in oases such as Medina, which also produces fruit and honey. The chief port is Jidda (250,000), linked with Mecca by asphalt road and receiving pilgrims from India and Indonesia by steamers and from the opposite coast of Africa by dhows. Over 250,000 of these pilgrims visit Mecca annually.

The vast interior, known as the Nejd, is a great red sandstone desert with fairly frequent oases which form links along the many caravan routes with junctions at such centres as Jauf, Hail, and Riyadh (300,000) the capital. Caravans of camels carry goods such as dates, barley, hides, wool, and ghi (clarified butter). Camels, horses, donkeys, and sheep are reared. An American company is now obtaining petroleum from a field near the Persian Gulf. An entirely new town of several thousand inhabitants, Ras el Mishaab, has grown up as the headquarters of this oil-field and terminal of pipe line (the T.A.P. line, or Trans-Arabian-Pipe-line) which carries oil across Saudi Arabia to Hail and thence through Jordan to Sidon on the Lebanese coast. This pipe line, which was built at a cost of over £50 million, is intended to convey at least 14 million tons of petroleum a year, thus saving the services of a fleet of 60 large tankers using the circuitous Cape route. The Saudi Arabian oil-field is now producing over 100 million tons a year, or considerably more than Persia before the Anglo-Iranian dispute.

The U.S.A. is by far the greatest trade partner of Arabia, taking £20 million of oil and sending over £15 million of machinery and vehicles.

YEMEN in the extreme south-west is a mountainous country (area 75,000 square miles) and is chiefly noted for its coffee, which is of very high quality. It is grown on the hill-slopes facing the Red Sea and is exported from Mocha, after which town it is named. Coffee exports are down to one-quarter of their former volume because many of the hillslopes are now devoted to the cultivation of qat, a bush whose green privet-like leaves are much in demand as a stimulus by chewing.

The capital, Ta'iz (population 14,000), is situated between the coastal desert of Tihama and the Nejran desert on the Saudi Arabian border. Most of the 4 million people of the Yemen live on the high granite plateaux between Ta'iz and Sana. They terrace the hillslopes and use the summer rain for their crops of barley, wheat, and millet.

THE REPUBLIC OF SOUTH YEMEN succeeded the short-lived Federation of Southern Arabia in late 1967. The area of some 130,000 square miles consists almost entirely of semi-desert. The summers are intensely hot with a humid atmosphere with occasional short and sharp rainstorms. The latter are a mixed blessing because on the one hand they give rise to sporadic vegetation similar to that of the Syrian desert and provide grazing for the flocks of nomadic Beduin who come from considerable distances. On the other hand, they cause the "Seyle"—a sudden torrent which rushes down the wadis ruining crops of cotton and barley. In the western area in Abyan and Lahej there are modern irrigation works used for cotton which has an annual yield of over 50,000 bales.

The former British colony of Aden was the third largest port in the Commonwealth after London and Liverpool, handling over 28 million tons of shipping annually. Its prosperity was based on: (i) It was a port of call for vessels using the Suez Canal route between Europe and the Indian and Pacific Oceans. It was greatly used as a refuelling port for ships after the long run across the Indian Ocean. Large numbers of passengers made purchases from the free port,

i.e. duty-free goods. (ii) Its large trans-shipment trade, handling goods from East Africa and other parts of Southern Arabia. (iii) The oil refinery; and (iv) the presence of the large military garrison. Even when the Suez Canal is re-opened it is doubtful whether Aden will ever regain its prosperity, because more and more passengers are travelling by air, the trans-shipment trade was already dwindling, and the garrison has finally departed.

The population of the republic is about 1·25 million, of whom over 200,000 live in Aden.

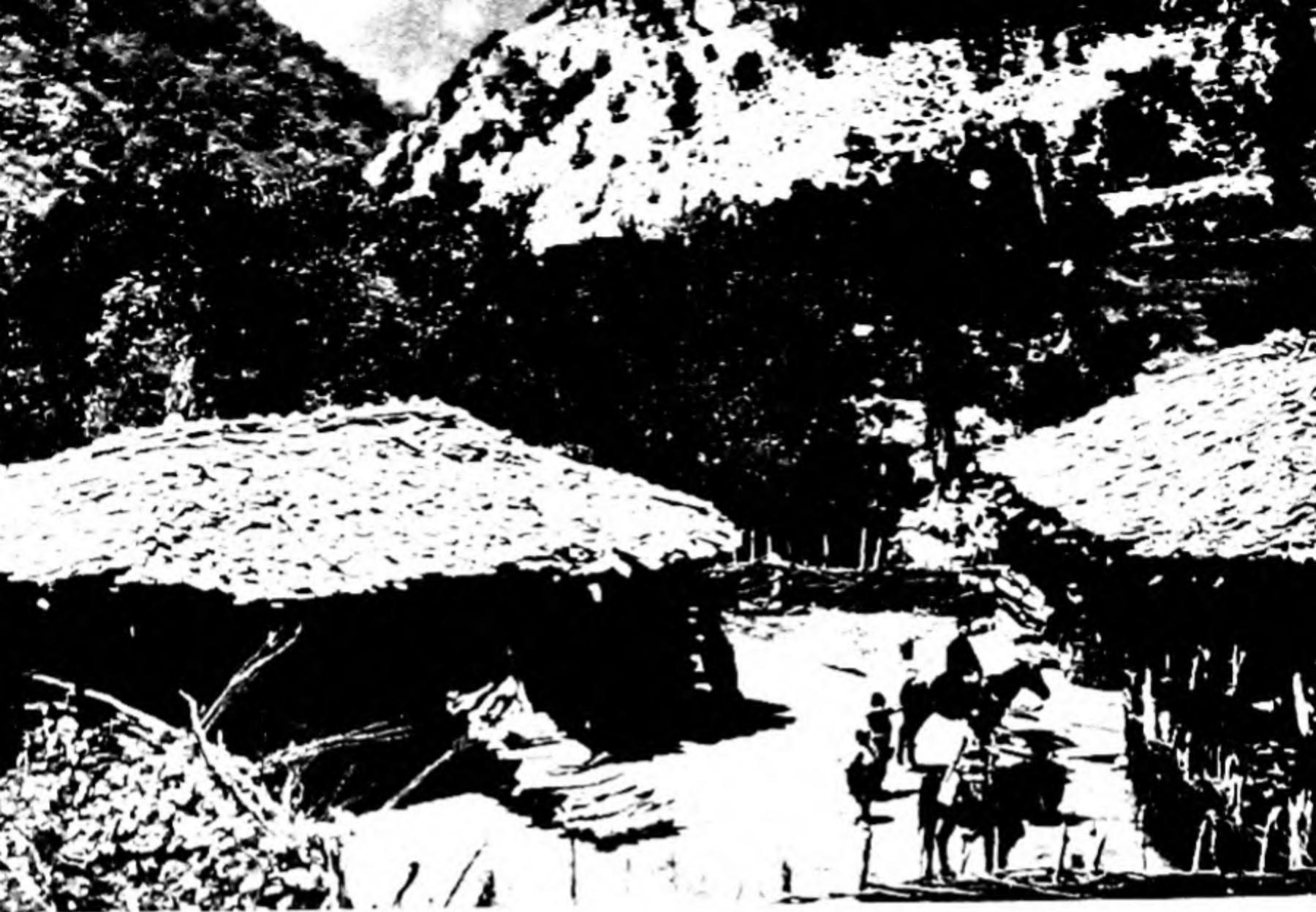
THE HADHRAMAUT is the name given to the coastal belt facing the Gulf of Aden and is ruled by several Sultans. As there is only intermittent rainfall, mainly in spring, the area is semi-desert, but along some of the wadis the streams are guided by sand-dykes into fields where millet and barley are sown on the moist soil. In other wadis, *e.g.* the Wadi Hadhramaut, wells are used. Here dates are grown, each palm being surrounded by its own moat. The flowers have to be dusted with pollen to fertilise them. In the semi-desert there are many nebк trees which serve a variety of purposes. The wood is dark, hard, and close grained, and is used as building timber; the tree has an edible fruit, and its leafy branches are beaten down with long poles to serve as fodder for goats. In Hadhramaut the women and girls act as goat-herds and do much of the other manual labour, including collecting thorn bushes for fuel. The towns are built close against the steep sides of the limestone cliffs which overlook the wadis. Many of the buildings are very tall, but as they are made of mud they need much attention after the occasional rainstorms to prevent them crumbling. Many of the men of all the Arab coasts, and of the island of Sokotra, are engaged as sailors, trading, like their ancestors, in dhows which penetrate to all the ports of the northern and western coasts of the Indian Ocean, *e.g.* over 2,000 dhows enter Aden every year.

MUSCAT AND OMAN, an independent Sultanate at the entrance to the Persian Gulf, has a coastline of nearly 1,000 miles. There is a plain along the north coast, never more than 10 miles wide and backed by the Jebel Akhdar Range.



Over: TURKEY. THE CUBUK DAM, TEN MILES NORTH OF ANKARA. (Exclusive News Agency.)

Below: TEHERAN. (Exclusive News Agency.)



Above: The

Mountain Province. (Exclusive Ac-

Beyond this there is a plateau about 1,000 ft. in height. The most favoured part is the Batineh coast plain which produces very fine quality dates that come on to the market before those of Iraq. There is another fertile area on Jebel Akhdar where there is sufficient rainfall to allow grass to grow. Camels are reared in the interior. The total population just exceeds half a million and most of them are Arabs. The towns are inhabited mainly by Indians, Baluchis, and Negroes, the last having been introduced originally as slaves. Muscat, the capital, has a population of 6,000 and is the chief port, but it has lost most of its internal trade to Matrah (14,000) which is the starting point of caravan routes. The chief exports, mainly to India, are dates, pomegranates, limes, and dried fish. Oil has been struck in the interior, near Fahad, 150 miles south-west of Muscat.

KUWAIT STATE (6,000 square miles), in the north-west corner of the Persian Gulf, is for the most part a desert with patches of borage and coarse grass. Dhows are built from timber imported from Malabar and East Africa. Petroleum production is increasing rapidly, and is now over 100 million tons, making Kuwait by far the largest producer in the Gulf area. A new port, Mina al Ahmadi, is now the headquarters of the largest shipping line in the world, the British Tanker Company, transferred from Abadan. The total tonnage of vessels using the port exceeds that using London. The population of Kuwait (310,000) has benefited greatly from the £150 million received annually in royalties. The provision of adequate supplies of drinking water has always been a problem. It used to be brought in dhows from the Shatt-el-Arab but with the development of the oil field and the influx of workers this source became totally insufficient. Sea water distillation plants were installed providing 5 million gallons a day. Then in 1960 large quantities of sweet water were discovered some 50 miles to the north of Kuwait town, yielding 3.5 million gallons a day. In April 1964 an agreement was reached with Iraq to pipe 120 million gallons a day which provides ample supplies, not only for the oil-fields but also for agricultural and afforestation schemes. The Kuwait-Saudi Arabia Neutral Zone, east of Kuwait, yields over 20 million tons of petroleum annually and the Qatar Peninsula is another area

rich in petroleum (annual output 11 million tons).

THE TRUCIAL COAST consists of seven sheikdoms which until 1971 were under British protection and which may form a Federation of Arab Emirates. They are, with the exception of Ras al Kaimah, a flat desert with moving sand-dunes in the interior and a swampy coast which is much indented. Ras al Kaimah is a high ridge, and at its foot is a fertile belt of red sandstone which is watered by streams from the ridge, good quality vegetables being produced. Until recently the sheikdoms were poverty stricken, and neglected, but now no longer, because of their oil. Indeed the largest of them, Abu Dhabi, is already producing oil both from the Umm Shaif underwater field some 60 miles off the coast, with a terminal on Das Island, and from a new mainland field at Murban. The annual output is over 14 million tons. The port, which has been modernised uses de-salinated sea-water. As in Bahrain pearl fishing has declined because of the competition of the Japanese cultured variety. There is an important international airport. Abu Dhabi extends across the desert to the oasis of Buraimi, whose villages produce dates, limes, lemons, and wheat with the aid of water brought from distant springs by channels called *falaj*.

THE BAHRAIN ARCHIPELAGO lies 20 miles off the Arabian coast, the largest island being about the size of the Isle of Wight, *i.e.* about 150 square miles. Fresh water is obtained from some 200 springs which are fed by rains which fall on the Persian mountains. The Persian Gulf is a syncline between the anti-clinal mountains of Persia and Arabia. This means that the strata exposed on the flanks of the anti-clines dip under the Persian Gulf, forming a kind of basin. The rain which falls on porous limestone layers soaks into them and seeps downwards. In time the limestone becomes rather like a saturated sponge and fresh supplies of moisture force the original water up to the surface where the limestone is exposed. Dates, citrus fruits, and lucerne are grown and donkeys are reared. Annual production of oil is about 2½ million tons and there is an important oil refinery, processing about 12 million tons, imported from Saudi Arabia. A new ocean port of Mina al Sulman has been built.

CHAPTER V

THE WESTERN PLATEAUX

Turkey

Turkey in Asia consists of the plateau of Anatolia which is bounded on the north by the Canik (or Pontine) Mountains and on the south by the Taurus Mountains—both fold systems. The northern coastal plain is extremely narrow as is usual with concordant coastlines, *i.e.* where the relief runs parallel with the shore, but in the south there are the two relatively wide plains of Antalya and Adana. As most of the relief lines are from east to west, the west coast, which is discordant, has many deep running gulfs and long narrow peninsulas, while the hinterland is an undulating region of alternating ridges and valleys. The most notable of the latter is the Menderes Valley. The highest country is along the extreme eastern edge culminating in the extinct volcano, Ararat (16,000 ft.). In the south-eastern corner there is a part of the Assyrian plateau and the Syrian coastal area known as the Hatay. The population has risen from 20 million in 1950 to 31.4 million in 1965.

There are two important areas of inland drainage on the plateau. In the western one several streams flow from the surrounding mountains into lakes, of which the largest is Tuz Golu. There are also some salt lakes. In the eastern area there is Lake Van which is 6,000 ft. above sea-level. Many short and swift streams which originally rose on the Pontic and Taurus Mountains have so eroded their valleys that they have encroached on the plateau. The best example is the Euphrates which rises in Mount Ararat and makes a very winding course through the mountains, in parts of which it is separated from the Tigris by only the narrowest of ridges.

The plateau is arid and hot in summer, and bleak and windswept in winter with frequent snowstorms. Along the north coast there is an ample rainfall with a maximum in winter, as well as a considerable amount in summer when the north-east winds blow straight on to the coast from the Black Sea. Thus, at Rize the rainfall is 50 in. with an autumn maximum. Note that this is more than that of

Izmir (20 in.) because, although the latter faces west and has the usual Mediterranean winter rainfall, it is in the "rain-shadow" of the plateau and Pontic ranges in relation to the summer winds. The plains of the southern fringe have a much lighter rainfall because owing to the configuration of the coast the plains are sheltered from the west by southward loops of the Taurus Mountains.

Much of the plateau is covered with steppe-land which is similar to the original Central Asiatic homeland of the Turks who for centuries remained a semi-nomadic and pastoral people. In recent years, however, there has been a considerable development with irrigation. Much of the south-western part of the plateau is a semi-desert, but cotton is grown in the Konya and Kayseri districts, much of it being spun and woven at the latter town, which is in the ancient province of Cappadocia. Grain growing (mainly wheat and barley) has greatly increased recently, and Turkey is now the world's fourth largest exporter of grain. It grows 8 million tons of wheat and 4 million tons of barley. Sugar-beet is a relatively new crop yielding 500,000 tons of refined sugar.

This is a highly volcanic area, there being no fewer than 50,000 cones of extinct volcanoes. They have been much eroded by grit being blown against them with a somewhat similar effect to that of sand-paper. Hard blocks of lava have created pillars by protecting the softer sandstone beneath them. The whole of the area has been covered with hundreds of feet of volcanic ash with an upper layer of lava or pumice. Across it a tributary of the Kizil Irmak has eroded a deep valley. On the valley sides, houses have been excavated with their cellars cut in the rock-face behind them. The soil is formed of decomposed volcanic tufa and it is enriched by guano, the droppings of thousands of pigeons which live in disused churches and which, for superstitious reasons, are not killed by the peasantry. Fine crops of apricots, grapes, melons, and tomatoes are grown. Walnut wood is exported for veneer. On most of the plateau, however, the chief occupation is sheep and goat rearing, the hair of the mohair goat being particularly valuable. In the Konya and Afyon Karahisar districts the opium poppy is an important crop.

In the eastern highlands stock rearing is the chief occupation, but the completion of the railway to Lake Van and the

development of the south-eastern oil-field near Siirt will do much to open up this hitherto unimportant region. The railway is being extended beyond Lake Van to the Iran boundary at Kotur. It will then continue to Teheran via Tabriz. Lake Van will be crossed by ferry-boat. The important part played by stock rearing in Turkish economy can be seen from the fact that there are 16 million sheep and 11 million goats, 3 million of the latter being of the mohair breed. Over 60 million lb. of wool, 15 million lb. of goat hair, and 14 million lb. of mohair are clipped annually.

Most of the cultivation is carried on in the coastal areas. Thus, there are about 170,000 acres under tobacco, yielding over 100 million lb. The chief districts are Samsun in the north-east and Izmir (Smyrna) in the west. Figs and sultanas are grown in the latter area for export as dried fruit. Olive oil is produced mainly in the Aydin district in the south-west. Other crops are licorice-root, nuts, linseed, tea, and cotton. The last named is grown by irrigation on the Chukrova Plain around Mersin and Adana on the south-east coast and its cultivation has increased so rapidly that cotton now equals tobacco as Turkey's chief export. The total crop now averages 300,000 tons. Silkworms are fed on mulberry leaves in the Bursa region of the north-west. Rice is an important crop near the mouths of rivers.

In recent years attention has been paid to exploitation of mineral wealth. There is a coal-field at Zonguldak on the Black Sea coast with an annual output of about 7 million tons of high-grade coal. Turkey is second world producer of chrome, which is used as a hardening agent for steel and for chromium plating. The production is at the rate of about 600,000 tons annually, mostly for export. Copper is mined at Hopah near the Caucasus. Oil has been found in the Adana area near Mersin, where a refinery has been built.

About 70 per cent. of the people work on the land, but in 1934 the Government drew up a five-year plan for the development of industries. The chief venture was in iron and steel. The furnaces at Karabuk, 100 miles inland from the coal-field, produce about 500,000 tons of rolled iron and steel, and 1½ million tons of coke annually. There are other steel works at Eregli, on the Black Sea, producing

rolled sheets, steel strip, and tin plate, the total output being about half a million tons annually. In 1960 two large power stations began operating at Hirfanli and Demikopru. One-fifth of Turkey's power requirements are now provided by hydro-electricity. Other increasingly important industries are cement (3 million tons), wool, and cotton. There has also been much recent improvement in transport. Prior to 1923 there was only one railway, part of the uncompleted Berlin-Baghdad line, a single track one, which crossed Turkey from Uskudar (Scutari) to the Syrian border, with a branch to Ankara and another line to Izmir. Now the main line has been doubled and many other tracks have been laid linking Ankara with all the other important towns. We have mentioned the line to Iran. The construction of a short length between Diyabakir and Mardin will join Turkey to Iraq. 15,000 miles of main roads have been built, and ports and harbours have been improved.

Ankara, the capital (population 1,300,000), replaced Istanbul in 1920 when the new Republican Government decided that it was more suitable as it was more central, less vulnerable to attack, and more truly Turkish in character. Izmir (Symrna) (population 370,000), was originally a Greek colony, but by agreement between the two Governments a great exchange of Greeks and Turks took place so that there are now only a few thousand Greeks in the whole country.

Iran (Persia)

Beyond the volcanic knot of Ararat, the second great plateau, Iran, spreads across to the borders of Afghanistan and Pakistan. It is triangular in shape and varies in height from 3,000 ft. to 5,000 ft. above sea-level. In addition, however, Iran contains, in the south-west, quite a large area of the Mesopotamian trough, the Shatt-el-Arab forming part of the boundary. Narrow coastal plains skirt the Persian and Oman Gulfs and the Caspian. Separating the plateau from the Mesopotamian lowland are the successions of fold ranges, the Zagros Mountains. Along the northern rim are the Elburz Ranges, partly volcanic, the highest peak being the dominant Mount Demavend (18,600 ft.). The only river of any importance is the Karun, which helps to water the south-western oil-field province of Khazistan. It is navigable for

small steamers for seventy miles. Secondary ranges cross the plateau. On the western half there are several fresh-water lakes, but on the drier eastern half there are only salt lakes. Here there are the great "dashts" (semi-deserts) of Kavir and Lut where patches of scrub are scattered about the sand and boulders. In spring there is a carpet of flowers over much of the area, but there are some inland islands of true desert.

Oil is by far the most important product. Production is now around 97 million tons. The chief fields are in the foot-hill country south-east of the Zagros Mountains. There is a new field 90 miles south of Teheran, where a refinery has been built. The Trans-Iranian pipeline carries natural gas to the U.S.S.R.

In 1954 a British company secured a concession to develop the mineral wealth of two areas totalling 30,000 square miles —one at Sennan, east of Teheran, and the other at Samshaba, to the west, containing iron, sulphur, manganese, lead, copper, and chrome, and iron is mined at Yazd. There are steel-works near Isfahan and at Arak, in Central Iran machine-tool works. It is proposed to export 2 million tons of iron-ore to Britain annually. Other mineral products are coal, salt, and turquoise. The first is mined in the Mazanderan district of the Elburz and supplies Teheran with fuel. Salt is obtained from the eastern lakes, and turquoise, a beautiful blue stone, is used for the ceilings of mosques.

Wool is the second most important product. Much of it is obtained from fat-tailed sheep. Many fine carpets are woven at Tabriz and Hamadan in the west and Kerman in the east, and these form a chief export next to petroleum. Many of the sheep are reared in the wild mountain country of the south-west where the Bakhtiari and Kashkai tribesmen are still under the control of feudal chieftains (Khans). These and other tribes, who are semi-nomadic, number about one-third of the population. They are nearly all descendants of invaders who have come at various times from the steppe lands of South-West Asia. The most numerous are the Kurds who live on the north-western borders in the Province of Azerbaijan. They number 1½ million. The Kashkais are a well-organised group of tribes, 400,000 strong, who inhabit the areas around Shiraz and Isfahan. Like the Kurds, they live in villages during the winter. They cultivate mainly wheat

and barley in the high and fertile valleys of Semiran. In April they leave the hot plateau and drive their flocks of sheep, which number 7 million, to the high summer grazing grounds (6-8,000 ft.) to the west of Isfahan. This gigantic movement, which is reversed in the following autumn, is a cause of much friction between the tribesmen and the sedentary peasants through whose lands they have to pass, despite precautions taken to avoid damage. The Kashkai are also noted as horse-breeders. Cotton is grown in the Isfahan area where there are woollen and cotton mills, and also a good deal of raw cotton is exported. There is a considerable production of tobacco, and the cultivation of tea is on the increase in Northern Iran. Cane-sugar is now being produced at the rate of over 100,000 tons a year, and rice is grown along the narrow Caspian coastal strip. There is a large sturgeon fishery, mainly for caviare. The great need is for the development of communications. The Second World War helped in this direction because the dire need of Russia for supplies from her Western allies led to a railway being built from Bandar Shahpur on the Persian Gulf to Bandar Shah on the Caspian.

Teheran, the capital, is situated in the northern part of the country in the foothills of the Elburz Mountains. It has a population of nearly 2 million, many of whom are employed in glass works, match factories, chemical, small arms, and ammunition works. The population has increased rapidly in recent years owing to the establishment of these industries. Valuable goods are exported by air and road to Western Europe. This has led to the abandonment of villages and farms in the surrounding countryside. Tabriz (population 275,000), capital of the province of Azerbaijan, is situated in the fertile and sheltered Talkhee Valley draining to the large Lake Urmia. Yezd, 300 miles south-east of Teheran, is irrigated by sixty canals supplied by tunnels (*qanats*) tapping underground streams. Pahlevi, on the Caspian, is a centre of the sturgeon fishery and a seaside resort. The total population of Iran is about 22 million. The average density is 35 per square mile.

Afghanistan

The third plateau country, Afghanistan, is bisected by the Koh-i-Baba Range which exceeds 17,000 ft. and is continued



Above: TEL-AVIV, THE COMMERCIAL CAPITAL OF ISRAEL. (Courtesy, N. S. B.)

Below: A JEWISH COMMUNAL SETTLEMENT. (Courtesy, T. M. C.)



Above: LEBANON. AN APPLE ORCHARD. Note the TERRACING. APPLES ARE ONE OF LEBANON'S CHIEF EXPORTS.

Below: TIBERIAS AND THE SEA OF GALILEE. (Donald McLeish)

in the extreme north-eastern corner as the Hindu Kush. To the south-west is the basin of Seistan which is drained by a series of rivers of which the Helmand River, flowing into a large depression on the Afghan-Persian border, is the most important. The northern section has a general slope to the Amu Daria Basin, which river forms part of the boundary with the U.S.S.R. Many streams flow northwards but most of them become swallowed up in the sands in the foothills. In the extreme east there is a relatively small but important area drained by the Kabul River, a tributary of the Indus.

The total area is about a quarter of a million square miles and the population is about 13 million, so that the density is 52 to the square mile. Much of the country is too mountainous and too dry for cultivation, but there are quite extensive plains and valleys which are irrigated, some from wells, giving good crops of barley, wheat, fruit, and vegetables. Methods of agriculture are primitive, but some progress is being made, e.g. the scythe is being used in place of the sickle for harvesting. This work is done mainly by wandering Kunchi tribesmen from the Jellalabad area near the Khyber. There are 2 million nomads in the country, and one of the Government's aims is to settle them at the rate of about 15,000 a year in villages served by irrigation. A wide variety of fruits is grown, which, with wheat and nuts, form the staple foods. Some of the fruits are grapes, citrus fruits, apricots, peaches, pears, plums, apples, cherries, figs, mulberries, quince, and pomegranates. Of the nuts, almonds, walnuts, and pistachios are the most important.

Much of the plateau is covered with steppe which carries a rich growth of grass in the spring. Lucerne, which can be cut several times a year, is the chief fodder crop. In the south and east two crops a year are grown. In the spring, wheat, barley, and lentils are harvested, and in the autumn, rice, millet, sorghum, tobacco, sugar-beet, and maize.

Large numbers of fat-tailed sheep are reared, providing the chief meat food. The fat in the tails yields grease, and the wool and sheepskins are used for clothing. "Persian lamb skins" (Karakul) provide one-third of Afghanistan's exports by value. Many of the shepherds are nomadic, using in summer the

pastures of the Hindu Kush and wintering on the more sheltered plains of North-West Pakistan. There are over 12 million sheep, $6\frac{3}{4}$ million goats, $2\frac{1}{2}$ million cattle, 40 million poultry, and 200,000 camels in Afghanistan.

Much was hoped from the Helmand River Scheme for irrigation and hydro-electricity, but this has proved a partial failure because of the saline nature of the soil. More is perhaps to be hoped from the development of the Kataghan province in the north. This very fertile area was malarial, so that there had been a steady migration to the south, but the land has been reclaimed and hydro-electricity is being developed, with the result that the population has increased from 5,000 to 22,000.

There are many signs of mineral wealth, but, as in Iran, lack of transport facilities has hindered its development. It is known that there are rich deposits of copper in the north and plenty of good quality coal on the northern slopes of the Hindu Kush. There are two known oil-fields, one in the west near Herat and the other in the north. There is an important export of natural gas to the U.S.S.R. There is a small output of silver and some gold is mined near Kandahar. Other worked minerals are iron, lead, asbestos, mica, sulphur, and lapis lazuli. The last named is mined in the province of Bailukhshan and is made into ornaments which are exported, especially to U.S.A. Salt is exported in considerable quantities to India and Pakistan. Sulphur exists in abundance in Dar-i-Sul and is being sold to U.S.S.R.

Some efforts have been made to develop industries and to further encourage the nomadic element of the population to settle down. Hydro-electric power has been developed in the Kunduz Valley of the Hindu Kush for the cotton mills and sugar refineries of the new workers' city of Pul-i-Khomri (population 10,000) which is mainly populated by former nomads. The cotton and sugar-beet are grown locally. Other cotton mills have been opened in Kunduz, Jebel-um-Siroj, and Mazar-i-Sharif. The main industry of the country is carpet making, which is still largely carried on as a cottage industry by women. Daulatabad is the most noted centre. Fruit preserving is increasingly important. It consists mainly of drying fruit, chiefly apricots, but there is a modern canning factory

at Kandahar. Fruit and nuts form one-eighth of the exports of Afghanistan. Further industrialisation is bound to occur now that the hydro-electric scheme on the Kabul River at Sarobi, 30 miles from the capital, has been completed.

There are no railways in the country and only a few good roads on which some three thousand lorries are used. Most of the transport is by camel and pony. The country is very isolated, the only important link with Pakistan with which most of the trade is carried on being by the road from Kabul to Peshawar across the Khyber Pass. Other roads are: (1) from Herat, one of the most important route centres in Asia, to Kandahar and Kabul. This road skirts the southern edge of the central highlands and passes mainly across desert. (2) Then there is the road from Kabul across the Hindu Kush by the Shibar Pass to Mazar-i-Sharif, the capital of Afghan Turkistan, a road famous for the beautiful scenery through which it passes and known as the "Gateway to the North." Finally, a triangle is completed by the road from Herat to Mazar-i-Sharif via Maimana, which follows the old silk-caravan route.

The capital, Kabul, has a population of 450,000, some of whom work in small factories making leather goods, buttons, matches, woollen goods, and a steel-rolling mill. Although the country is inhabited by several different racial types speaking different languages there is no disunity, for all are united by their common Moslem faith and, as in Switzerland, by the feeling that powerful neighbours are covetous of their land.

CHAPTER VI

THE LEVANT

The countries along the south-east shores of the Mediterranean are known as Levantine—"of the Rising Sun".

They form the western arc of the "Fertile Crescent", which extends from the head of the Persian Gulf to the Nile Valley. Owing to its position between the desert and the sea it has long been a bridgeland between Asia and Africa and between the Mesopotamian plain and the Mediterranean. It has been crossed by generations of traders and invaders, and its peoples have developed a strong spirit of independence and a high trading instinct. Pockets of these invaders have been left, so that the population is very cosmopolitan. Thus, in Syria and the Lebanon alone there are twelve distinctly different types and twelve religions.

Structurally, the area consists of the much fractured and faulted north-western edge of the Arabian crust block. Syria contains a large area of the plateau itself and extends eastwards across a considerable part of the Middle Euphrates basin. The faulting has been roughly parallel to the coast so that the area is divided into a series of north-south belts. Firstly, there is a narrow coastal plain, which is a mere foothold in much of the north and centre but which widens considerably towards the south. In the two former parts there are several minor indentations, but south of the promontory of Mount Carmel it becomes very regular.

Backing the coastal plain the land rises steeply to high ground in the north and centre, being particularly high in the Lebanon Mountains where some summits reach 8,000 ft. and are snow covered in winter. In the south the land rises more gently across the Shephelah to the flat-topped plateau of Judaea. Beyond this belt of high lands there is a sharp drop to the rift valley, the northern end of the "Great African Rift". In the north it is drained by the Asi northwards, and in the centre by the Litani southwards. Then, as it widens and deepens, it is occupied first by Lake Tiberias (Sea of Galilee), which is drained by the Jordan into the Dead Sea, whose floor

is 1,290 ft. below sea-level. To the east of the Rift Valley lies the Arabian plateau, whose western edge forms a high barrier, except in the extreme north.

Four countries share the area, each with its own characteristics, which causes varying degrees of antagonism. Syria, the largest, was from 1958 to 1961 part of the United Arab Republic (with Egypt), but is once again a separate state; Lebanon, with a higher proportion of Christians than the others and greater sympathies with the West; Jordan, a kingdom; and Israel, the Jewish state, against whom all the others would be eager to sink their differences, partly for religious reasons and partly because of the bitterness engendered by the Palestinian Arab refugee problem.

This, one of the most inflammable areas in the world, has become vitally important as a bridgeland again, but nowadays for the carrying of oil by pipe lines from the Arabian and

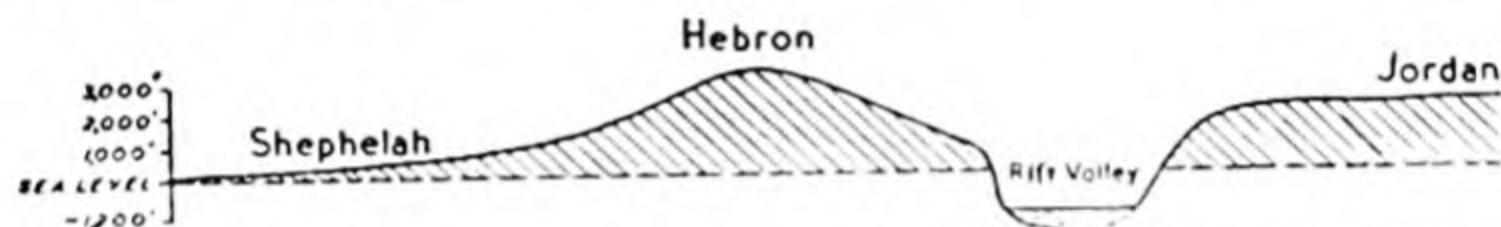


Fig. 15. EAST-WEST SECTION ACROSS ISRAEL AND THE RIFT VALLEY.

Iraqi oil-fields to the waiting tankers of the Western Nations at such terminals as Tripoli and Banias.

Syria (71,000 square miles, population 5.5 million).

This is by far the largest of the Levantine countries, for it extends from the Mediterranean to well beyond the Euphrates. It has only just over 100 miles of coastline and has a claim against Turkey for the return of the Hatay province to the north, which contains the useful port of Iskanderun (Alexandretta). The coastal province of Latakia is hemmed in by the lower northward extension of the Lebanon Mountains. It produces Mediterranean fruits and good quality tobacco. The chief port is Latakia, which handles most of the trade of the interior with which it is linked by rail via Aleppo. Two-thirds of its exports consist of wheat, barley, and cotton. The last-named has increased tenfold in importance, and now yields 100,000 tons annually. Banias and Tarsus are oil pipe line terminals. Beyond the mountains the Rift Valley is

drained by the Orontes River. The southern part of this valley is known as the plain of the Bekaa, which yields good crops of wheat. Like many Mediterranean lowlands it is malarial, for the *Anopheles*, or malaria-carrying mosquito, breeds in stagnant waters. The presence of malaria is a great scourge because in most cases it is recurrent, *i.e.* once a person has been infected by the germ, it breeds in his blood and he is liable to periodic outbursts. At each one he develops a raging fever and has to cease work. In any case, he never recovers his full energy, so that in malarial countries a large proportion of the population is lethargic. Much has been done to eliminate the disease by draining the 100,000 acres of the Gharb Marshes. In the Bekaa, methods are still very primitive, *e.g.* winnowing is done by hand. The chief towns are Hama (120,000) and Homs (160,000), both on the "Pilgrims' Railway", built before the First World War to link Turkey with Mecca. The railway enters Syria at Aleppo (500,000), chief commercial centre, with silk manufactures. The railway follows the Rift Valley for some distance, leaving it for Damascus. Short branches link it with Tripoli and Beirut.

In the extreme south-west lies the capital, Damascus (500,000), which occupies the largest of a series of spring line oases at the foot of the Anti-Lebanon. The other oases are occupied by villages, and apricots and barley are grown. The poor pastures surrounding the oases are grazed by sheep and goats. Damascus is an ancient caravan route centre, linking the Mediterranean and Egypt with Mesopotamia. It is now an important airport and long distance bus depot. It is one of the "Seven Earthly Paradises" of the Arabs, which is not surprising, for it is situated in a large oasis with beautiful trees and irrigated gardens, a refreshing sight to desert wanderers. It is still an important trading centre, with its great bazaar where may be bought copper and silver ware, carpets, shoes, books, swords, spices and sugar. It makes ivory canubs, leather goods, and a glue made from goats' horns, camels' feet, and mules' hoofs.

To the south of Damascus lies the Jebel Druse, inhabited by the Druse sect of whom there are some 160,000. They speak Arabic and they have a peculiar religion which is a mixture of Christianity, Judaism, and Muhammadanism. Their home is a great basaltic plateau rising to nearly 6,000 ft. On

their fertile volcanic soils they grow grapes, olives, and tobacco. They also breed silkworms. The altitude ensures sufficient rainfall for these products.

The remainder of Syria consists of poor steppe and semi-desert, by far the largest area but sparsely populated by semi-nomadic tribes who rear most of the 4 million sheep, 5 million goats, and 17,000 camels of Syria. The tribesmen in many ways lead the life of their ancestors, but the chieftains drive about in high-powered cars. It is in that region that vegetation springs up after the occasional rains. Nomadic herdsmen drive their animals to the districts where rain has fallen that they may take advantage of the temporary grazing. Beyond the Euphrates is a triangular area known as the Gezirah, where cultivation of cereals is increasing. They are sent to Latakia for export.

Lebanon

Lebanon is a small mountainous country that at no part exceeds 35 miles in breadth. The first sub-division is the extremely narrow coastal plain. It was the home of sea-trading Phoenicians, as we are reminded by the sites of Tyre and Sidon. Now it is inhabited mainly by people of mixed descent, but the majority are Christians, a unique feature in this part of the world. However, the proportion of Moslems is steadily increasing as many of the Christians emigrate. The chief occupation is the cultivation of Mediterranean fruits, using the streams from the Lebanon Mountains for irrigation. There are about 250,000 acres under olives; 150,000 acres under vines; 30,000 acres under figs; and 15,000 acres under oranges, lemons, and mandarines, a very small fruit like a tangerine. Bananas and apricots are also grown. Beirut, the capital, is rapidly increasing in importance as a port, airport, business centre, and summer resort. Its population has increased from a quarter of a million to half a million (out of a total Lebanese population of $1\frac{3}{4}$ million) in the past few years. It has gained much banking and insurance business at the expense of Cairo. It has the well-known American University which attracts students from all over the Near and Middle East. Tripoli (population 100,000), the other modern port, has gained in importance at the expense of Haifa since the latter ceased to be an oil pipe line terminal because Arab

transit states refused to allow oil to be pumped to Israel. Saida (Sidon) is another terminal. Both towns have oil refineries. Siblin, south of Beirut, has cement works. The Litani valley is undeveloped, but the Tiloh hydro-electric plant supplies the coastal belt with power.

The Lebanon Mountains, backing the coastal plain, were once covered with the famous cedars. Most of these disappeared long ago, as cedar wood proved such valuable building timber that the Phoenicians felled and exported much of it (e.g. to Solomon in Palestine for the Temple). Half way up the western slopes there are villages perched on terraces cut from the hillsides, and many of their inhabitants (Ansariyeh) are fair-haired and blue-eyed, probably descendants of Crusaders. The villages are surrounded by vineyards, mulberry trees, and apple orchards. In winter the snow-covered summits have become popular for winter sports. The Lebanon exports much of its fruit (apples and citrus) to other Arab countries and as far away as Britain.

Jordan

Jordan became an independent state (as *Trans-Jordan*) in March 1946, with an area of 37,000 square miles and a population of 500,000. In 1950, when it assumed its present name, it incorporated much of Arab Palestine (see Fig. 17). Its population is now about 2 million, and includes 500,000 Arab refugees from parts of Palestine that became the Jewish state of Israel. Most of the Bedouin are still pastoral nomads living in poverty with their camels, goats, and fat-tailed sheep.

El Ghor (the Rift Valley), in the hands of Israel at the time of writing, is the richest agricultural area. The East Ghor Canal brings water from the Yarmak River to irrigate 60,000 acres of formerly barren land, which now produces vegetables, olives, citrus fruits, and bananas. East of the River Jordan, the state is crossed from north to south by the Hejaz railway and the line roughly marks off the desert to the east from the agricultural area of the west. In the latter a beginning has been made with the development of agriculture by the cutting hillsides and by irrigation and afforestation. Ancient canals have been repaired, wells dug, and dams built. The country includes part of the Dead Sea Rift Valley,

potash and phosphates being extracted from the waters of the sea and exported (1960: 325,000 tons). The Arabs have given this valley, with its flat and wide floor and its steep side, the very descriptive name of El Ghor—The Ditch. When Arab

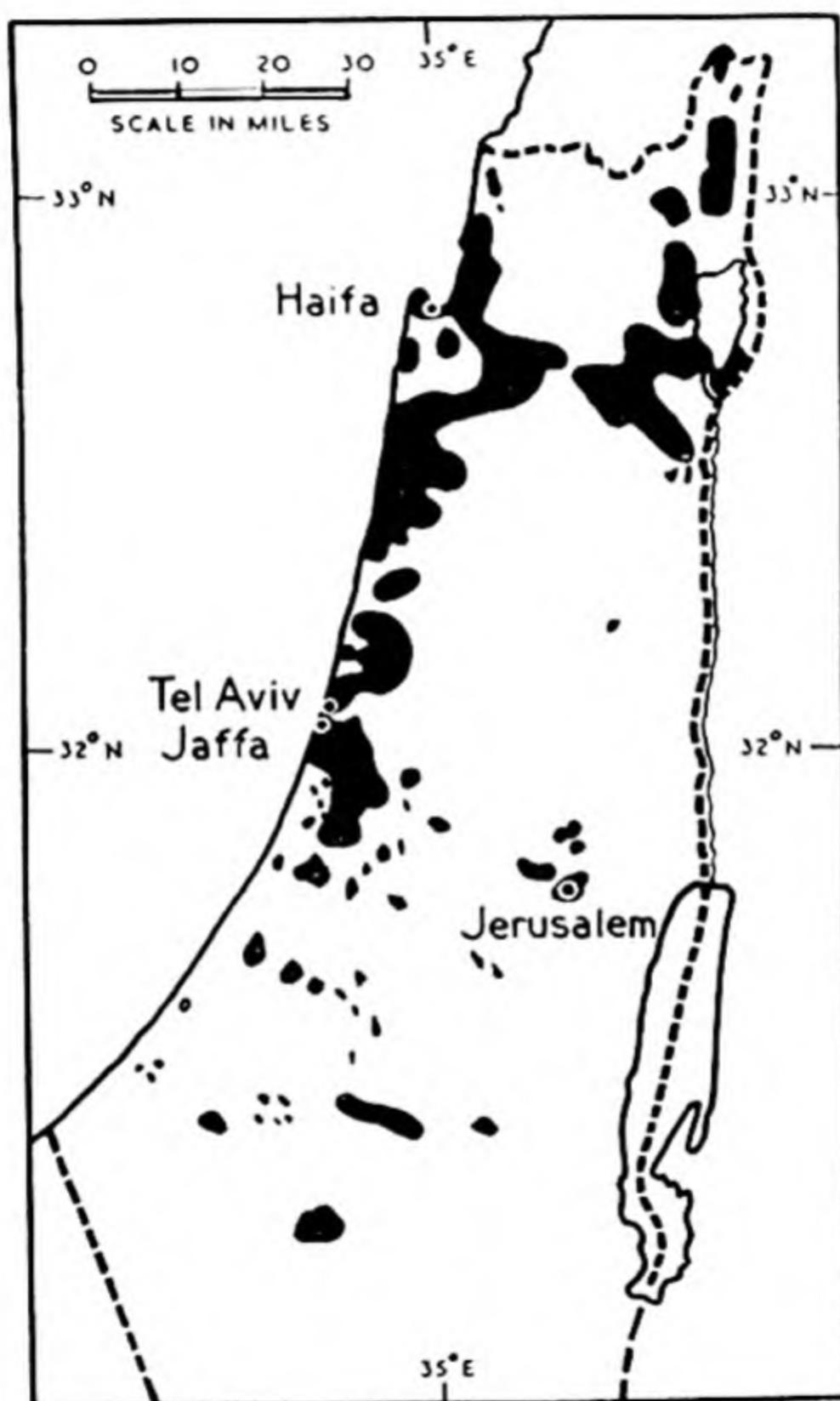


Fig. 16. PALESTINE—JEWISH COLONIES.

Palestine was added, Jordan gained a large part of the Plateau of Judaea, whose eastern edge rises steeply for some 2,000 ft. This part is mainly noteworthy because it gives Jordan part of the city of Jerusalem.

On the tiny strip of coast at the head of the Gulf of Aqaba lies the port of the same name which is being quickly developed

to handle the trade of Jordan. Amman, the capital, has grown rapidly in recent years and now has a population of 320,000 of whom nearly half are Palestinian Arabs. Its new oil refinery receives crude oil from the Trans-Arabian Pipe-line (T.A.P.) some 25 miles away. Nablus, the only other important town, has a vegetable oil industry.

Israel

The name Palestine is derived from the older name Philistia or "Land of the Philistines." Strictly speaking, this should apply only to the coastal plain, once the home of the agricultural people who irrigated the valleys of several streams which, like miniature "Niles," cross the barren coastal belt. It was these people who proved such stubborn enemies of the Jews. The modern representatives of the latter, now that they have assumed full control of their country, have renamed it Israel. Behind this coastal plain the land slopes gently upwards towards the interior until the flat topped Plateau of Judaea is reached. This consists of limestone which is very porous so that, although there are about 12 in. of rain in an average year, there are very few streams, for the water seeps into the ground. The vegetation is a rather thin grass. In places hills rise above the general level, and it was on a group of seven of these that the Jews built their capital—Jerusalem—no doubt because, as a military people, they realised the strategic value of its commanding position.

To the south the plateau widens and the rainfall decreases. To the north-west it tapers, to form a steep-sided narrow ridge ending in Mount Carmel which forms a cape, the only break in the coast line. This ridge separates one fertile lowland, the Plain of Philistia, from another, the wider Plain of Esdraelon, which extends from the Mediterranean to the Sea of Galilee. In the extreme north-west the land rises beyond the Plain of Esdraelon to the mountains of Upper Galilee, the southern end of the Lebanon system.

There have been Jewish colonies in Palestine since the late 17th century, but it was not until after the end of the First World War that there was any great movement of Jews back to the land of their ancestors. The population of Palestine in 1913 was about 500,000, of which 150,000, or 30 per cent., were Jews and 70 per cent. were Arabs. By 1948, the year

of independence, the population of the new Israel was 665,000, but comparisons are difficult because of the adjustments of territory and the displacement of a large proportion of the Arab population. With the formation of the new state a great wave of immigration set in, reaching its peak in 1949. In June 1954, the population of Israel was approximately 1,500,000, of which over 1,300,000, or 85 per cent., were Jews. The 1971 Census gave a population of 2,750,000, of whom 89 per cent. were Jews. The mainly Arab areas of Samaria and Judah, formerly part of Palestine, are now included in the state of Jordan. They contain some 700,000 Arabs, of whom more than half are refugees from Israel.

Any Jew can claim the right to enter Israel and immigration continues at a steady rate. The Government is anxious to build up its manpower in view of likely trouble with its Arab neighbours and to provide workers for its growing manufacturing industries. It must be remembered that there are always half a million men and women serving in the armed forces. As it is estimated that it costs £500 to settle each adult entrant, and as Israel's economy is not at all sound, the value of exports being less than half that of imports, it is obvious that the money must be found from "hidden imports". International Jewry subscribes great sums.

Let us now see what has been done since 1918. Many Jewish agricultural colonies (Kibbutzim) have been set up in the Plains of Sharon and of Esdraelon. They are worked on a system known as collective farming whereby all do their own particular jobs, most on the land but others at their trade. The profits are then shared by all. Before these colonies could be started much work had to be done. Streams choked by reeds had to be cleared so that they might be used for irrigation. There was a double advantage in this because the clearing led to the wiping out of malaria, as the mosquitoes responsible for spreading it could no longer breed. Towns had to be planned and built, and here the newcomers had the great advantage that they were starting from nothing and so were able to build really model settlements.

The money for all these buildings and irrigation schemes was collected by the Zionist movement all over the world. This movement also bought the necessary land from the Arab farmers.

Whatever the rights and wrongs of the case may be there is no doubt that by their modern methods of farming the Jews have greatly improved the economic condition of the country. Olives are grown, *e.g.* on the Mount of Olives and in many other coastal districts. the oil being partly used in the soap industry. Jaffa oranges have long been famous, having been grown in the first place by one of the original colonies near that ancient port, but nowadays their cultivation is more widespread. In addition, melons, cucumbers, celery, grapes, grape-fruit, figs, and strawberries are grown. In the sheltered hot valley of the Jordan papayas, pineapples and bananas are produced. Many of these are exported to Western Europe by air when out of season in their own countries and so fetch good prices. The chief field crops are clover, alfalfa, and maize, mainly for silage. Silage is a method of preserving green crops intended for fodder during a season when animals cannot get food from natural pastures. When harvested the crops are stored in concrete or metal cylindrical towers, layers of green crop being placed between layers of molasses, a treacly by-product of sugar. In Israel this mixture is brought out during the dry summer. On the higher lands there are large fields of wheat and barley harvested by combines. Cotton is becoming increasingly important. The Jews are scientific farmers and pay much attention to questions of strain, methods of feeding, and provision of proper poultry houses. Re-afforestation has played a big part in restoring economic prosperity. Thus the great Balfour Forest was planted partly to aid soil conservation and in the hope that it would increase the rainfall.

The Jews are pinning great hopes on what is known as the J.V.A. Scheme, *i.e.* the Jordan Valley Authority, which plans to use the waters of the Jordan for the irrigation of much of the drier parts of Israel. The Jordan is a very swift river which accounts for its name ("The Descender"). It rises in Lake Huleh, a papyrus-covered lake around whose shores live primitive Arabs. There is one Jewish settlement, Hulata, inhabited by fishermen. Then the river widens out to form Lake Tiberias (Sea of Galilee) upon whose shores stands Tiberias, a winter health resort with mineral springs. Further projects of J.V.A. are—(a) the draining and reclaiming of some thousands of acres of marshland which surround Lake

Huleh, thus not only bringing more land into cultivation but also destroying one more malarial area. It was once considered that the moist heat and malaria of the Rift Valley would prevent settlement on any large scale, but now the lowland is scattered with many village communities producing good crops of grain and early vegetables and such unaccustomed fruits as avocados and papayas, as well as those already mentioned.

(b) The irrigation of the arid Negev of Southern Israel, by using the Jordan waters. Already there are several settlements of an experimental nature in this arid three million acres, where it is claimed that a population of 55,000 could be increased to half a million. In Roman times, indeed, there were several flourishing cities, but these fell victims to Arab raiders and the surrounding lands were devastated by soil erosion and sand encroachment. Many of the ancient terraces, dams, and channels have been restored to bring rain water to the fruit gardens which produce grapes, pomegranates, figs, and almonds, as well as vegetables and fodder-crops. Dry farming is also yielding results and afforestation has proved successful as a means of protecting crops and soil from the wind. Marram grass has been sown to bind the sand and prevent it drifting. The northern part has a good loess soil covered by a thin layer of sand and could be very productive if irrigated. In the north-west, near Beersheba (30,000) water is piped from the Yarkand River near Tel-Aviv and fed in drops to the roots of individual plants, and in Zim in the central Negev dams have been built to pond back the annual flood waters caused by the short but heavy downpours of rain. Peaches are the chief product. The main scheme, the first stage of which was completed in May 1964, is to bring water from Lake Kenneret above Lake Tiberias by a 66 in. pipe line via the coastal plain.

There are great mineral potentialities in the southern Negev and five new cities are being built to act as development centres. Thus Dinera (10,000) is to serve the phosphate and potash works and also the bromine works at Sodom, where the minerals are extracted from the Dead Sea. It also has two large textile factories and a nuclear reactor. Eilat at the head of the Gulf of Aqaba is being developed as an

outlet for this region, especially for the export of salt, and an oil pipe line has been built from Eilat via Beersheba to Ashdod, thus enabling Israel to secure Middle East oil for her refineries at Haifa despite the fact that the Suez Canal is closed to her shipping and that Syria refuses to allow oil to be piped to Haifa. It is expanding rapidly as Israel's trade with eastern countries increases. Copper and granite are obtained from its near hinterland and local gems are mined.

Factory industries are well under way, and there are light engineering industries and oil refining at Haifa. Textiles form the major industry of Israel, using chiefly locally-grown cotton, but wool has to be imported. There is a large export of tweeds, raincoats, etc. Diamond polishing and soap making are important in Tel Aviv, and fruits and vegetables are canned at Ashdod, the new port south of Tel Aviv; Yascov and Afikim make wooden boxes and plywood.

To sum up, since 1948 the arable land has increased from 437,800 acres to well over 13 million acres and the irrigated land from 75,000 acres to 230,000 acres. The number of agricultural settlements has reached 1,000, double the number of 1948. Less than one-fifth of the population are engaged in agriculture, however, and four-fifths of the people live in towns. During this period, incidentally, industrial production has quadrupled.

In 1966, Israel's exports amounted to £210 million. Much the most important items were citrus fruits and polished diamonds, each of which accounted for a third of the total. Imports (£350 million) included machinery, transport equipment, cereals, iron and steel, and unpolished diamonds.

As can be seen from the map, the coastline of Israel is almost unbroken, and the bulk of its greatly increased foreign trade has had to be handled by lighters carrying goods to and from vessels anchored off-shore. Originally, the only port was the ancient one of Jaffa, built by the Arabs. The Jews have developed the adjacent Tel Aviv to serve the coastal plain and Jerusalem. With Jaffa, it now has a combined population of 390,000. In the north, on the only bay of the coast, Haifa deals with the trade of the fertile Plain of Esdracon. Now the up-to-date port facilities of the new artificial harbour at Ashdod will be a great help to Israel's expanding trade.

In 1950, Jerusalem was proclaimed as the capital. It has a commanding position on seven hills, and is also the traditional capital of the Jewish people, but it has two disadvantages: it is too near the border and it is divided between



Fig. 17. THE PARTITION OF PALESTINE.

Israel and Jordan. The population of the Israeli portion is 130,000.

All this has been achieved despite the frequent clashes between Arabs and Jews. According to the United Nations scheme the land was to have been divided between the Arabs and the Jews. The former would have occupied the north-western and south-western portions of the coastal plain

together with much of the plateau, whilst the latter would have received the central part of the coastal plain, where most of their irrigation colonies are placed, together with the Sea of Galilee—Dead Sea region, with its hydro-electric and agricultural development, and the Negev in the south, about which they have high hopes of development by irrigation. Owing to disputes between the two peoples, this decision was never implemented, the result being that most of the Arabs left much of the area allotted to them to swell as refugees the populations of Jordan and of the Gaza strip.

The above account of Jordan and Israel is based on the frontiers established by the Armistice agreements of 1948 between these two states and the states of Egypt, Syria and the Lebanon. In the face of threatening moves by Egypt, although no overt acts of war, Israel in June, 1967, launched a sudden attack on Egypt, Jordan and Syria, whom she defeated in six days. Israeli forces now occupy a small area in Syria, the whole of Jordan west of the River Jordan and the Sinai peninsula as far as the East bank of the Suez Canal (see Fig. 17).

With hostile Arab states on all her land frontiers, Israel's defence problems are difficult because of her narrow waist—it is only less than twenty miles from the western border of Jordan to the Mediterranean at Tel-Aviv. Moreover Egyptian fortifications in the Sinai peninsula could effectively control the narrow Gulf of Aqaba and thus seal off the Israeli port of Eilat. The areas now occupied by Israel give her considerably more defence in depth, and cover the Gulf of Aqaba.

It is possible that Israel would be prepared to withdraw to her 1948 frontiers if these were effectively guaranteed by the great powers. However, the Western Powers would find operations in the Eastern Mediterranean difficult, especially in the face of the growing naval strength in this area of Russia, the main Arab supporter.

Cyprus

The name Cyprus is derived from the Phoenician *Kypru*, "copper"; the mines having been worked by all the island's rulers.

The population (610,000) consists mainly of Greeks (80 per cent.) and Turks. Density is about 170 to the square mile.

A large part of the island is mountainous. The long, narrow Kyrenia fold range forms the northern coastal area including the Karpas peninsula which points finger-like towards the mainland. In the south-west corner there is a higher and wider mountain mass which rises in Mount Troodos to over 6,000 ft. In the south-east there is a fairly large and flat lowland, the Mesaoria Plain—which has been described as a perfect natural aerodrome.

The climate is typically East Mediterranean. The annual rainfall averages just over 20 in. at sea-level. It is thought that it was greater in the past before the forests were destroyed as it has been estimated the removal of the forests of a country causes a decrease of 5 per cent. of the rainfall. In Cyprus the mountain sides were once densely wooded but townspeople felled most of the trees for fuel. Young trees are killed by goats which destroy the bark and nibble off the young shoots. There are some 200,000 goats on the island and there was much resentment amongst their owners when the British reserved 600 square miles for re-afforestation, thus depriving them of grazing land. However, many of the former goat-herds are now employed as foresters. The lowland is a natural grassland with a mixture of olive trees, cypresses, and eucalyptus trees. Here again there has been much soil erosion.

The chief occupation is farming, much of it of a very primitive kind, but irrigation has brought improvements, especially on the Mesaoria Plain and particularly in the growth of vegetables (melons, 40,000 tons; cucumbers, 15,000 tons; carrots, 17,000 tons) for which there is a good market in Britain. The chief crops are olives, grapes, and carob nuts (locust beans). The olives are knocked down from the trees and primitive presses are used to extract the oil. There are nearly 2½ million olive trees yielding 15,000 tons of olives, from which are extracted 1,800 tons of oil. The average crop of grapes is 166,000 tons and 9½ million gallons of wine are pressed. There are over 2 million carob trees producing 61,000 tons of nuts. Oranges, lemons, tangerines, and grape-fruit are grown in the Famagusta and Nefka districts. The total citrus crop averages 140,000 tons, about 80 per cent. being exported (oranges,

3 million cases; lemons, 900,000; grapefruit, 2 million). In addition there are apricots, peaches, figs, almonds (2 million trees), pomegranates, apples, pears, plums, cherries, and hazel nuts. Tobacco is a general crop, and barley, wheat, flax, potatoes (170,000 tons), and onions are being increasingly grown as winter crops, the last-named providing an important export as do Cypriot wines. Cotton-growing is decreasing. As well as the goats there are some 300,000 fat-tailed sheep, so that goat bells and shepherd's pipes are commonly heard in the mountains.

Copper and iron pyrites, asbestos, gypsum, and a little chrome and gold are mined. There are important sponge fisheries, the work being done in the summer months. There are some old-established industries such as the spinning and weaving of silk. Lace is made at Lefkara. Ivory nuts are imported and from these artificial teeth and buttons are manufactured for export. Economic development was retarded firstly by the struggle for independence and later by the quarrel between Greeks and Turkish Cypriots. Tourism was particularly affected although the island has much to offer of scenic and historical interest and has a genial winter climate and with more stable economic conditions the island is receiving large numbers of visitors.

The chief towns are situated on the south-east coast and on the Mesaoria Plain. Nicosia, the capital (population 105,000), is situated at the inland apex of the plain, and Larnaca (20,000), Limassol (48,000), and Famagusta (35,000) are ports.

CHAPTER VII

THE INDIAN SUB-CONTINENT: GENERAL

This great sub-continent has an area of over 1½ million square miles and a population of over 533 millions. During the past 25 years the population has increased by 185 millions, or about 54 per cent. This huge population is divided into so many racial divisions, speaks so many languages, and professes so many religions, that a map showing any of these features looks like a patch-work quilt. Indeed, there was little understanding of India as a single country until the British introduced the idea, as is shown by the fact that there was no single name for the area. The name Bharat being used for the sub-continent and not as the name of a united country. The name India is ours and we derived it from the Greek.

There are three main relief divisions. To the north-west, north, and north-east there is the great mountain barrier of fold ranges which has had a far more isolating effect upon the sub-continent than the open boundary between Europe and Asia has had. Apart from relatively small Mongol penetration by very difficult routes in the eastern parts and the recent short-lived Chinese invasion from the north-east, the only land invasions have taken place through the Khyber Pass in the north-west corner and, to a lesser degree, through the Bolan Pass. Not all of this mountain rim is included within the boundaries of India or Pakistan except in the north-west corner where the state of Kashmir includes, not only the Himalayan Ranges, but also extends beyond the Upper Indus Valley to the Karakoram. In the north-east, indeed, the independent states of Nepal and Bhutan encroach upon the Ganges Lowland.

Parallel to the first region runs the Indo-Gangetic Plain, a lowland which acts as a natural drainage trench into which the waters of the surrounding uplands pour. The western part is drained by the Indus. In the upper basin five rivers flow across the undulating foreland of the Punjab ("Land of

the Five Rivers"). They are the Jhelum, Chenab, Ravi, Sutlej, and Beas. They all converge in the south-west to form the Lower Indus which winds its way to its great delta. To the east of the Sutlej a "saddle" divides the Indus and the Ganges Basins. Across this saddle flows the Ghaggar which loses itself in the Thar. Draining the eastern part of the saddle are



Fig. 18. INDIA AND PAKISTAN—RELIEF AND RIVERS.

the Ganges and Jumna which converge on each other and join at Allahabad, well on the southern edge of the plain. A whole series of tributaries including the Gumti, Gogra, and Rapti, flow in a south-easterly direction from the Himalayas to join the Ganges between Varanasi (Benares) and Patna. At the eastern end of the plain two rivers flow through the gap between the Rajmahal Hills of Bihar and the Khasi Hills of

Assam. The Ganges and Brahmaputra form a common delta with a great number of distributaries at the northern end of the Bay of Bengal. Along the mouths there is a belt of mangrove swamps known as the Sunderbans. The Brahmaputra rises as the Tsang-Po quite close to the source of the Sutlej, and after flowing eastwards breaks its way through the Himalayas to the Gangetic Plain. Because it has received the silt of so many powerful mountain streams which have borne their loads over, perhaps, millions of years, only to drop them when

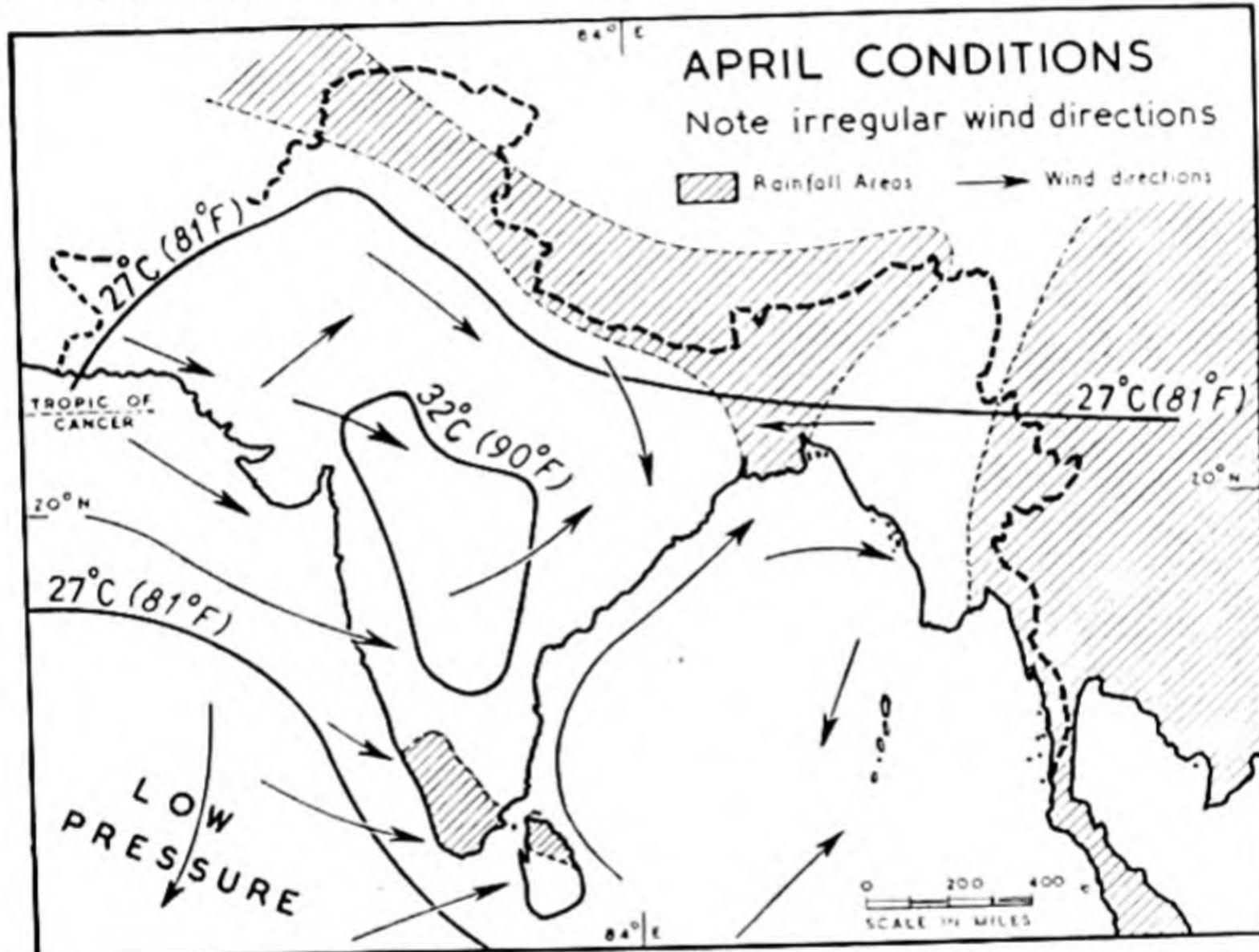


Fig. 19.

their flows are checked on reaching the lowlands, most of the Indo-Gangetic Plain is covered in depth with alluvium of great fertility. Provided there is adequate rainfall or that there are facilities for irrigation, high crop yields are obtained. Throughout the lowland the winters are warm enough to enable cultivation to be carried on. This has led to its becoming the largest continuous area of intensively farmed land in the world. The differences in crops between the different parts are caused partly by differences in drainage and partly by variations in rainfall. If we travel from the

Bay of Bengal along the lowland to the Arabian Sea we start with the great delta of the Ganges-Brahmaputra with a rainfall of over 80 in. This is followed by the better-drained Middle Ganges Valley with a rainfall of 40 in.-60 in. Then comes the Upper Ganges and Punjab regions which are relatively high and have 10 in.-20 in. of rain. Finally, the Lower Indus Valley has less than 5 in. of rain and is in many ways similar to Egypt with a narrow fertile belt along the river, bordered by desert.

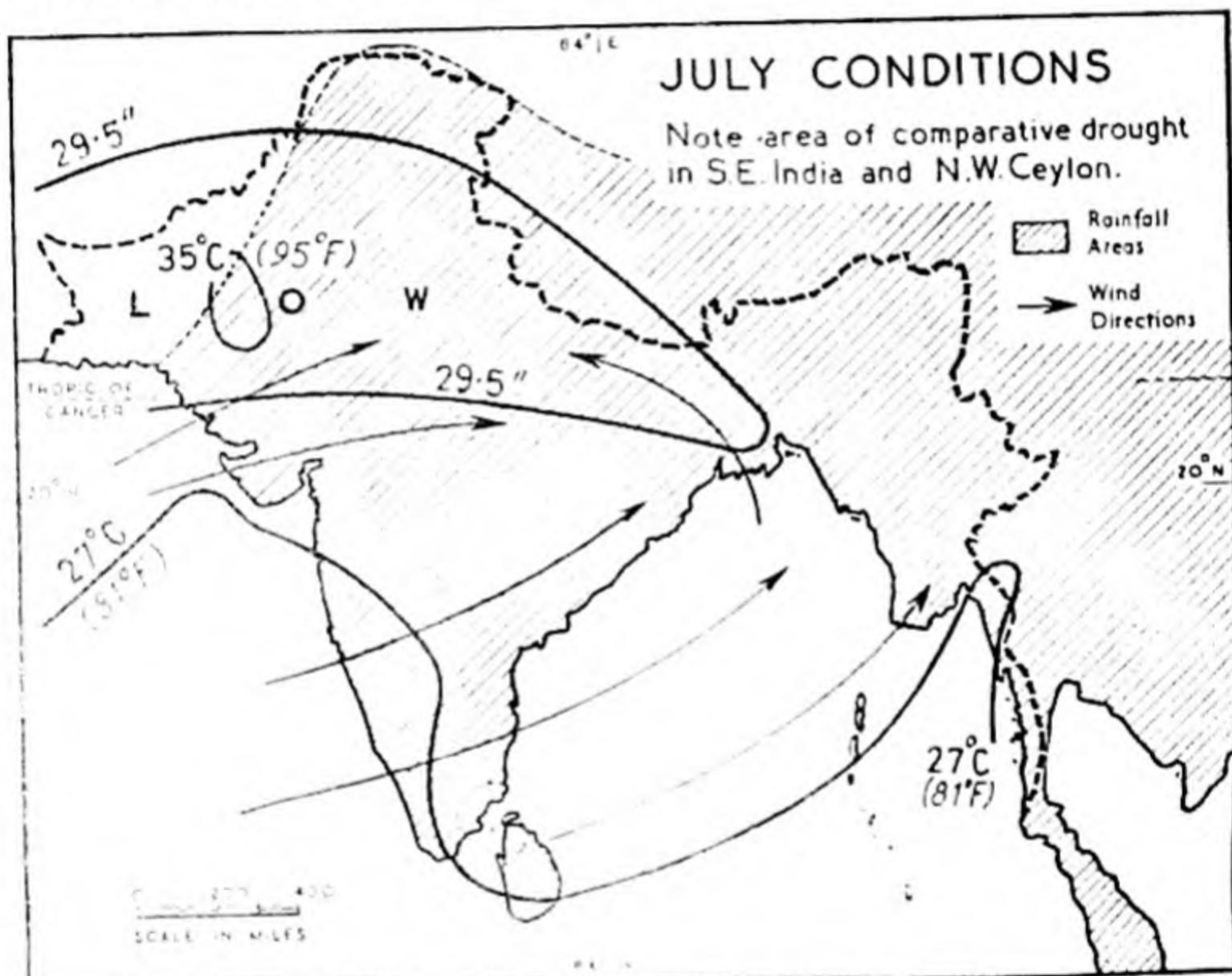


Fig. 20.

The Peninsula of India consists mainly of the Deccan, an ancient massif which has been tilted from west to east and which forms a great triangle tapering southwards. Its higher western edge is known as the Western Ghats. The plateau is drained by a series of rivers which rise along the northern and western edges and flow to the Bay of Bengal. Their basins conform fairly closely to a pattern. A number of lesser streams drain circular basins and converge upon the main river which has cut a gorge through the Eastern Ghats to descend on to the coastal plain where it flows to the sea.

through its delta. The chief rivers are the Mahanadi, Godavari, and Kistna.

Geologically the plateau consists of very ancient crystalline rock, but a large part of the north-west is covered with volcanic material, mainly basalt. In the extreme south the Nilgiri Hills rise to over 8,750 ft. A low saddle, the Palghat, links these to the Cardamom Hills. The south-east corner of India consists of the basin of the Cauvery River which repeats the features of the Deccan rivers but at a lower altitude.

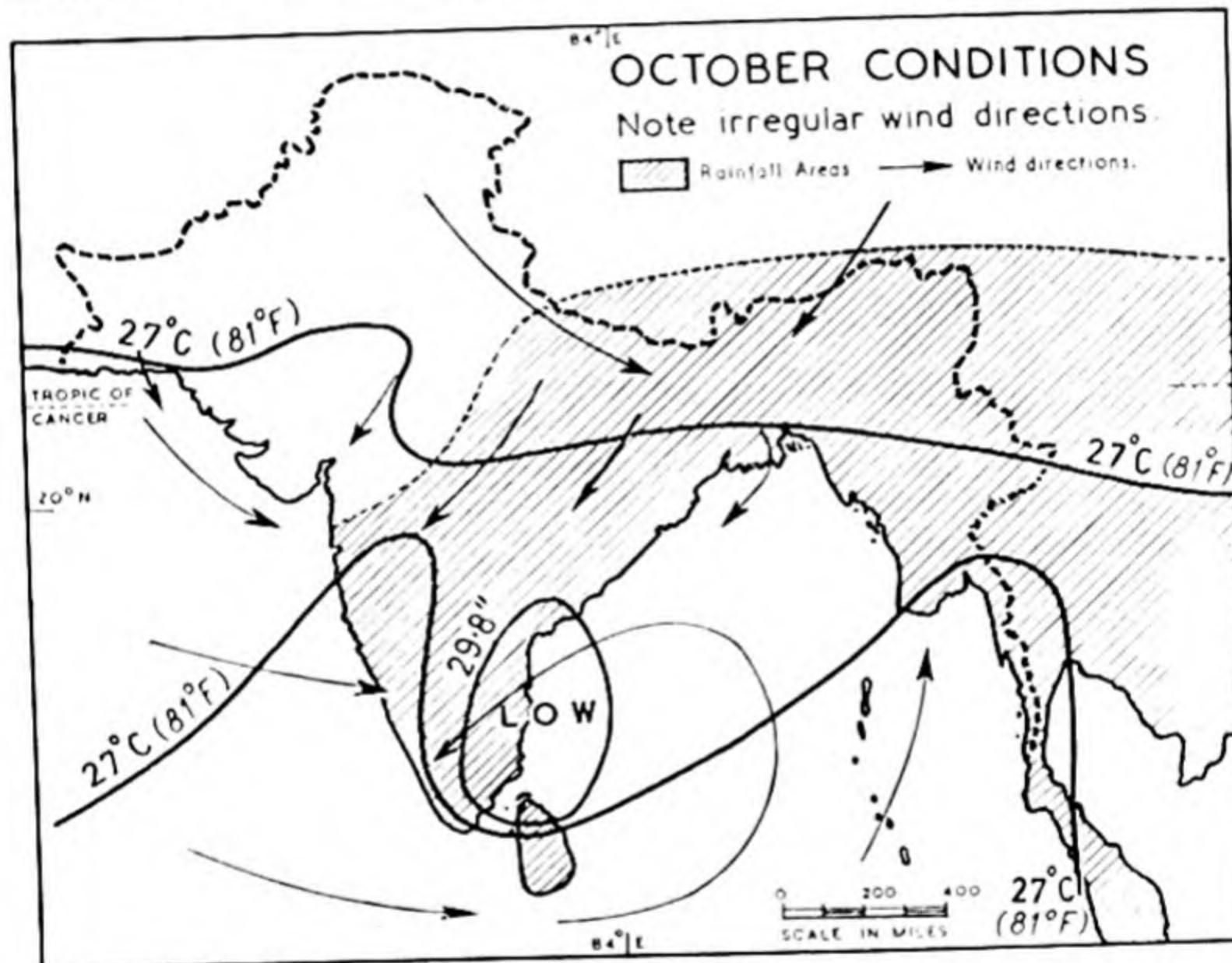


Fig. 21.

The north-western edge of the Deccan is bounded by the Vindhya Range. Beyond this there is a trough drained in the south-west by the Maki River and in the north-east by the Chambal tributary of the Jumna. Northwestwards the land rises again to the Aravalli Hills which overlook the Thar.

Climate

India's climate shows the normal features of the monsoon lands, as indicated on pp. 28-31. The relief and configuration cause certain modifications of detail. Thus from May to

early September there is a general stream of air from south-west to north-east and the rainfall spreads from south to north. As the moisture laden air reaches the steep edge of the Western Ghats the sudden forced rise causes cooling, and so there is a belt of heavy rainfall along the west coastlands (over 80 in.). The rainfall decreases across the Deccan (20 in.-40 in.). Air streams moving across the Bay of Bengal also absorb moisture and being drawn into the Ganges Basin, cause

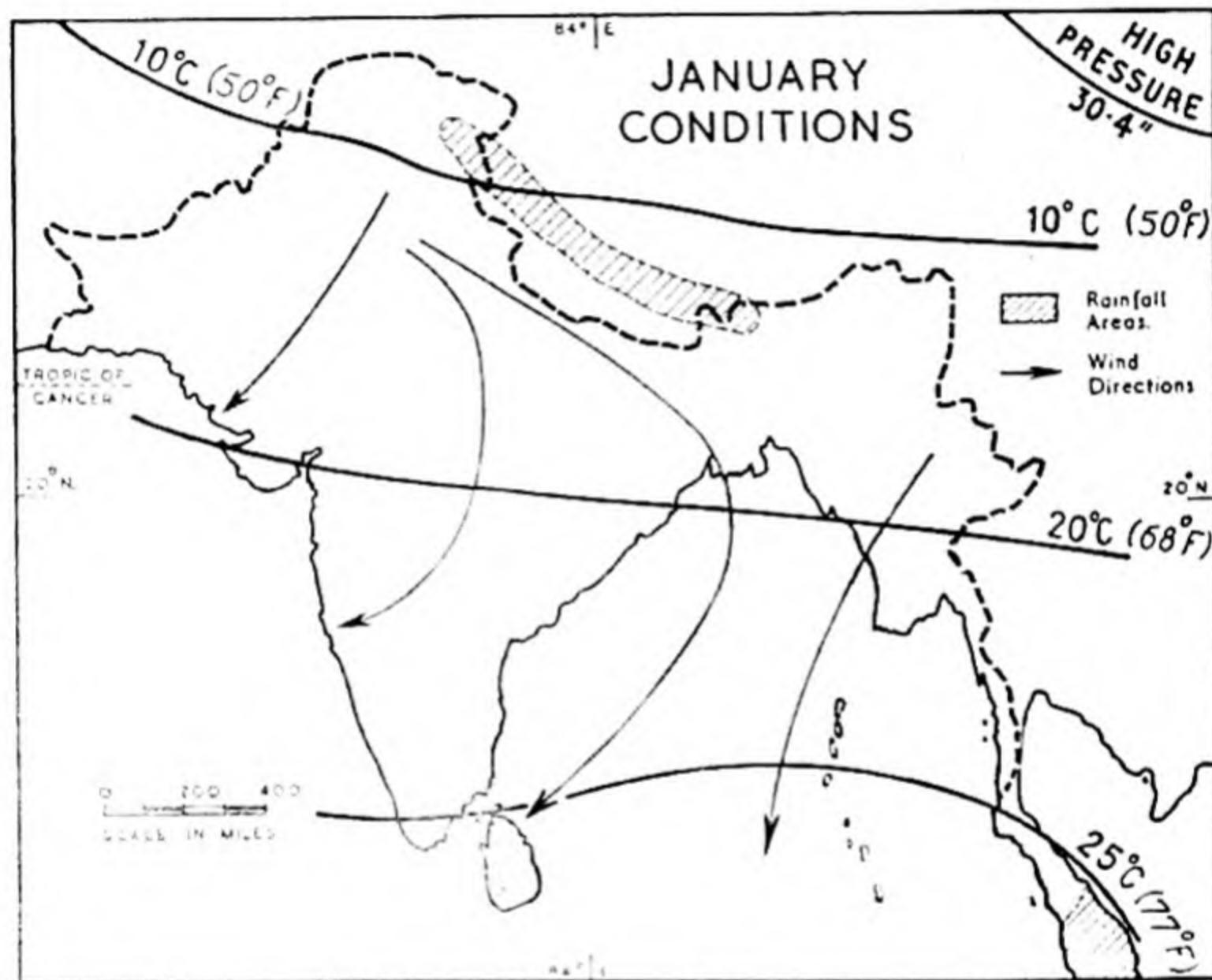


Fig. 22.

another belt of heavy rain with the highest known annual average in the world at Cherrapungi. In winter only the southern extremity of India receives any appreciable rainfall, which is caused by the north-east monsoon picking up moisture as it crosses the Bay of Bengal. One part of India has little or no rainfall—the Lower Indus Basin or Thar Desert. March and September are particularly unsettled months, especially in coastal belts, as wind arrows on the maps show. This is caused by the changes of season at the equinoxes,

when there is a struggle between land and sea influences. At mid-summer all parts of India, with the exception of the mountain ranges, have actual average temperatures well above 27° C. (80° F.), but in winter they vary from just over 10° C. (50° F.) in the north-west to 27° C. (80° F.) in the extreme south.

Peoples

Politically the term India is now applicable only to the Republic of that name, which comprises the greater part of the Ganges Basin and those parts of the peninsula that were

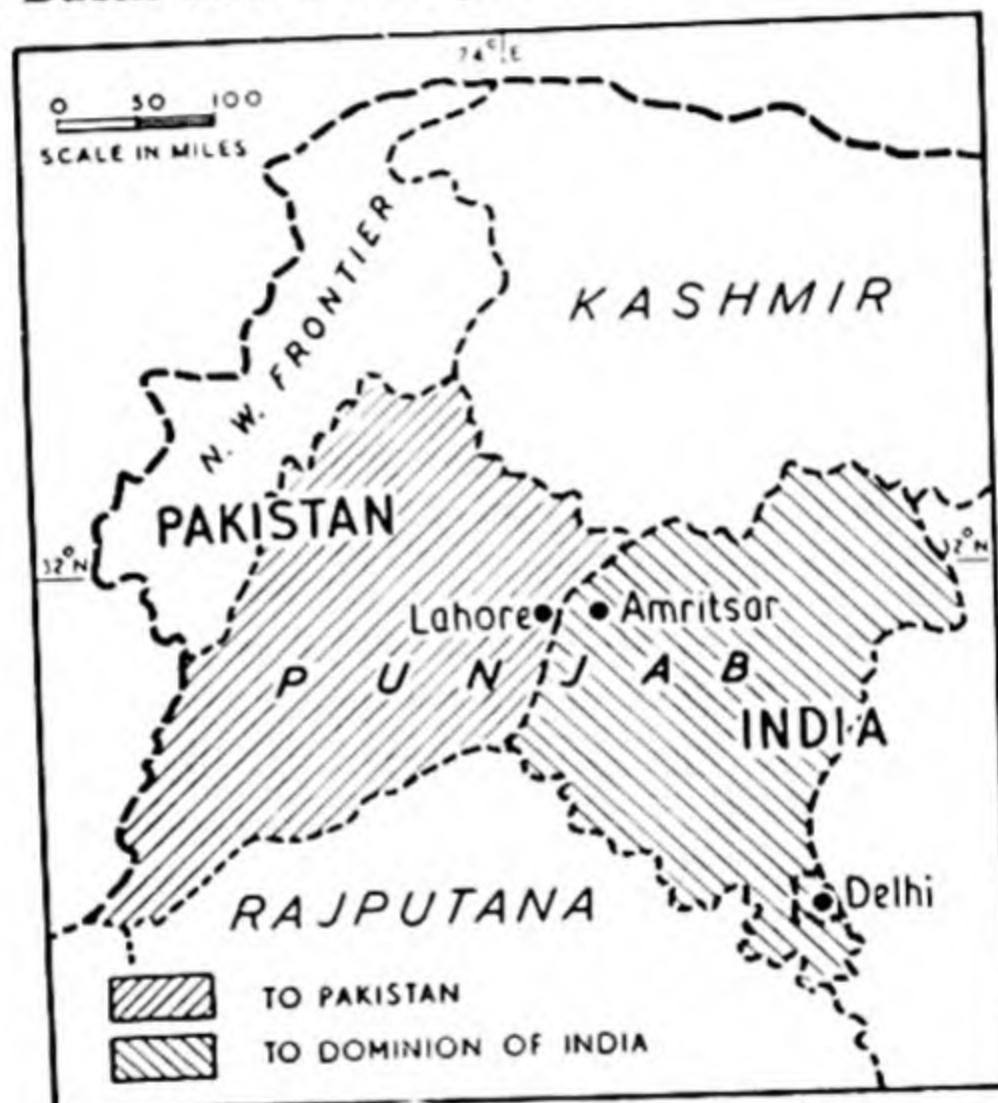


Fig. 23. THE PARTITION OF THE PUNJAB.

included within British India, together with many of the hitherto self-governing States in those areas. It is peopled chiefly by Hindus. The remainder of the sub-continent consists of the Republics of Pakistan and Bangladesh, the former having a predominantly Moslem population but the latter a large Hindu minority.

In an area where there was such an intermixture of peoples of different races, languages, and religions (see Tables p. 91) it was not to be expected that the clear cut sub-division into two States could be carried out without trouble. The

first major difficulty arose in the Eastern Punjab, which was divided between the two States by mutual agreement. Owing to the development of vast irrigation systems the pressure of population in the Ganges Lowland had been greatly relieved because the people migrated to take over the newly irrigated lands. This accounts for the mixture of types of population in the Punjab where 57 per cent. are Moslem to 26 per cent. Hindus and 12 per cent. Sikhs. The last named preserve their individuality by observing different customs, religious rites, and dress from those of their neighbours. The relatively mixed population has led to the Punjab being a difficult area from the political point of view. The majority of the Moslems supported the idea of Pakistan, *i.e.* the areas of India mainly inhabited by Moslems to be an autonomous state, whereas the Congress Party (mainly composed of Hindus) would hear of nothing but a single united India.

Eventually the Moslem idea was adopted. However carefully the line of demarcation between Pakistan's Western Punjab and India's Eastern Punjab was drawn, millions of people were bound to find themselves on the wrong side of the line so mixed were the communities. In the summer of 1947, therefore, one of the greatest mass movements of history occurred. It was, indeed, a two-way movement, for Sikhs and Hindus travelled eastwards into "India" and Moslems westward into Pakistan. From August to December 8,500,000 refugees moved across the frontier. 4,400,000 of these were Hindus and Sikhs and 4,100,000 were Moslems. Only about one-quarter of the total number travelled by train in organised parties. The remainder trekked with bullock-carts laden with their family belongings, driving their cattle. All were liable to be attacked, and amongst their perils there were outbreaks of the deadly plague, cholera. More were to follow; in 1971 civil war broke out and millions fled from East Bengal into India.

A second problem to arise was that of the position of the hitherto semi-independent States ruled by their own Princes and acknowledging the supremacy of the British Raj. Most of them opted to join one or other of the States, but in a few cases, such as Kashmir and Hyderabad, there was difficulty—Kashmir still causes trouble.

In Hyderabad, for example, a Hindu people was ruled by a Moslem prince, and in Kashmir a Hindu prince ruled a

RELIGIONS OF THE SUB-CONTINENT, 1951

ADHERENTS (millions)

RELIGION	INDIA	PAKISTAN
Hindu ..	303.2	9.8
Muslim ..	35.4	70.0
Christians ..	8.2	0.5
Sikhs ..	6.2	—
Jains ..	1.6	—
Buddhists ..	0.2	0.3
Others ..	1.9	0.1

RISE IN POPULATION OF THE SUB-CONTINENT

YEAR	POPULATION
1891 ..	279,400,000
1901 ..	283,900,000
1911 ..	303,000,000
1921 ..	305,700,000
1931 ..	338,100,000
1941 ..	389,000,000
1951 India ..	359,000,000
1951 Pakistan ..	79,000,000
1961 India ..	438,000,000
1961 Pakistan ..	96,000,000
1966 India ..	482,000,000
1966 Pakistan ..	106,000,000

Moslem people. In the former, India occupied the State and dispossessed the Nizam. In the latter case civil war resulted and the two Dominions came to blows (1966). For years the Security Council of the United Nations tried to find a solution, but they had no success. There have also been cases when a ruler has refused to allow his territory to be absorbed—the outstanding example being Baluchistan, a large and mountainous territory on the south-western borders of Pakistan. This problem has been largely solved by the decision of the ruler of Kalat, whose territories cover a great part of Eastern Baluchistan, to accede to Pakistan.

The military strength of Pakistan is much less than that of Hindustan (India). A consequence of this has been the withdrawal of troops from the north-west frontier territory of Waziristan, whose tribesmen have menaced the plainsmen.

Of the total population of 588 million (1966), 81 per cent. are Hindus and 17 per cent. are Moslems. There are also 6 million Sikhs, 1½ million Jains, 6 million Christians, 100,000

Parsees, as well as about 25 million Pagans who live mainly in the mountains of the Northern Deccan and in the extreme north-east.

Most of the peoples of the sub-continent entered the country through the Khyber Pass. The negroid aborigines were forced into the mountainous areas by the pre-Aryan Dravidians, who, in their turn, have been crowded into the extreme south-eastern area. Next came the Indo-Aryan branch of the white

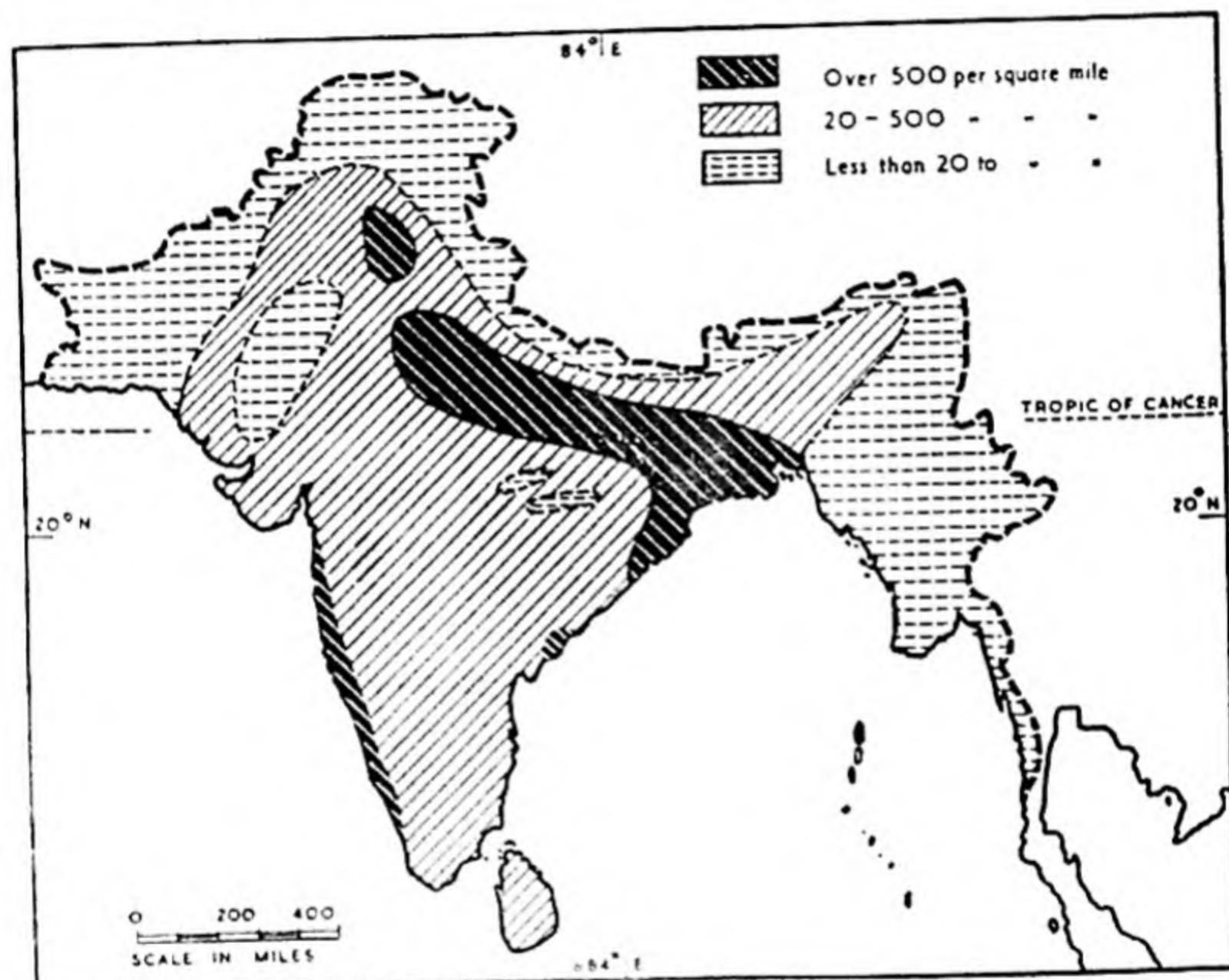


Fig. 24. DENSITY OF POPULATION.

race—first the tribes that were to become the Hindus, and later the Moslems. The former now live chiefly in the North-West Deccan and the Ganges Valley, and the latter in the Indus Basin, although there is a large Moslem community in the Lower Ganges area. The Aryan Moslems were prevented from penetrating southwards on to the Deccan by the triple barrier of the Vindhya, Satpura, and Aganta Ranges. The Sikhs live on the "saddle" between the Indus and Ganges

Valleys, and the Parsees in the Bombay area. The latter are descended from fire-worshipping refugees from Iran, who fled rather than adopt the Moslem religion.

The density of population is high in all parts, with the exception of the Thar and of the mountainous areas. Indeed, in most parts there are more people than the country can supply properly under the present agricultural economy. The population has increased rapidly in recent decades, as the tables and graph show. This is owing to the greatly improved conditions of health services which have reduced the death rate, especially that of young children. Some idea

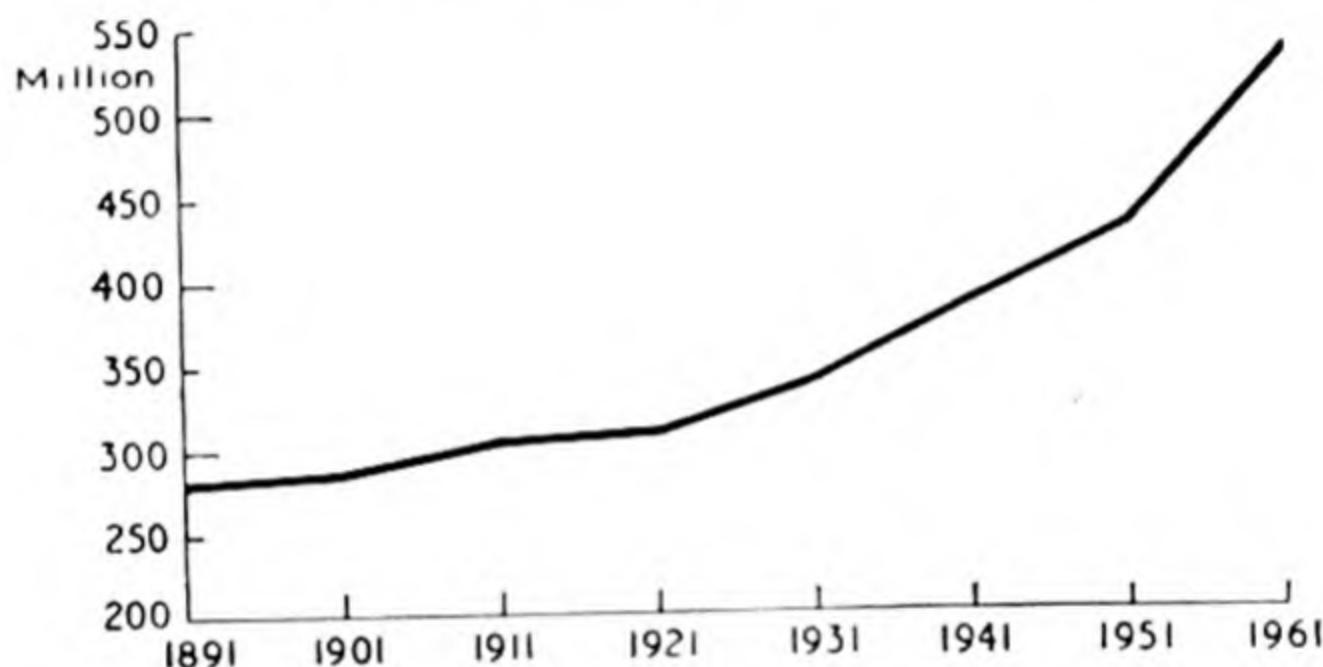


Fig. 25. GRAPH TO SHOW RISE IN THE POPULATION OF THE INDIAN SUB-CONTINENT. (Annual increase, 2.5 per cent.)

Note the sharp rise after 1921, when the effects of irrigation schemes, famine relief, and medical services were beginning to make themselves felt.

of the problems still facing the health services is the fact that over one million people die annually of malaria alone, and malaria is a disease which can be practically eliminated in a civilised country by draining mosquito breeding swamps and by the use of anti-malarial medicines, such as quinine or the more modern and easily produced mepacrine and paludrine. Other scourges are cholera and hook-worm. It must be remembered that the improved and improving state of health of this and all other tropical and sub-tropical countries is bound to produce serious problems of another type. Will they be able to produce enough to support their rapidly increasing population, and how will this affect the economies and politics of the "Western" nations? All Southern Asiatic

nations are being greatly helped by the Colombo Plan which is the result of a Conference held in that city and attended by representatives of Pakistan, India, Burma, and Ceylon as well as those of Australia, Great Britain, etc. The Plan is to provide mutual economic assistance and advice, and many of the developments mentioned in succeeding chapters have been made possible by it. India has its own Five Year Plans for economic development, the first three having been completed.

In India irrigation schemes have been developed and have reduced the risk of famine which used to wipe out great numbers annually. They have also relieved the pressure of population by opening up great new areas for cultivation, e.g. in the Punjab and, more recently, in the Lower Indus Basin. Now most of these areas have become fully populated and very few more are available, except for comparatively small ones, but as the result of the Five Year Plans many new irrigation projects have been completed, or are nearing completion, with the object of improving the standard in already cultivated areas. During the last twenty years the total area under irrigation has increased by over a quarter. Details will be found in the appropriate sections in the next chapter.

There is, of course, much room for improvement in Indian methods of agriculture. Old-fashioned implements are used and there is little or no idea of crop rotation. As a result crop yields have been low, e.g. 800 lb. of rice per acre in India and 1,200 in Pakistan, compared with 2,000 in China and 3,500 in Japan. The governments concerned are making great efforts to encourage better methods of cultivation, the use of higher-yielding types of seed and more fertilisers, and have had some success, especially with the introduction of "miracle rice" from the Philippines, and Mexican wheat which have often increased yields fivefold. As always, however, in countries with a low standard of living, money is desperately short. This on the one hand handicaps governments in financing agricultural research and education, and on the other hand makes the poor farmer usually unable to find the additional capital needed to take advantage of improved methods of cultivation.

There are thousands of square miles of forest land which, if cleared, could be made to support large numbers of people, especially in the coastal lowlands. Many more wells could be

sunk in the already inhabited areas. The sub-continent has a greater number of cattle than any other country in the world (in India alone there are 240 million cattle), but most of them are kept by Hindus. The latter, for religious reasons, will not kill any animals, so that a large proportion is either too old to be of use, or is diseased. Much valuable food is wasted and pasture land is used which might be yielding food crops. Even a large part of the cow-dung, which could be a valuable fertiliser, is used as fuel but this is unavoidable because of the lack of wood or coal. Little improvement can be expected until the general standard of education has been raised. What has to be done in this direction will be realised from the fact that in 1961 only 24 per cent. were literate.

The average annual amount spent per head is only £20 (in Britain it is £180). Many of the city dwellers live in slums on the outskirts, and there are many beggars—mainly professional, such as the self-maimed. Lepers are sometimes seen. Conditions are no better in the rural areas, where a large proportion of the people live in mud huts with broken roofs, without windows and often without beds, the only furnishing being large pots for grain storage.

Another way to relieve the economic pressure upon the population is to develop manufacturing industries, and already a good start has been made in this direction (see Chapters VIII and IX). We may quote the varied industries of Bombay, Howrah, Kanpur, Bangalore, and Karachi, and the great new iron and steel works at Durgapur, Bilhai, and Rourkela. Nevertheless, only about 3 per cent. of the population are employed in factories.

The sub-division of "India" into the independent Republics of India and Pakistan has led to economic problems. India has five times the population of Pakistan. India has most of the mineral wealth and nearly all the present factories, but has to import large quantities of food and raw materials, such as cotton and jute. Pakistan has no food problem and with considerable export surpluses of cotton is in the stronger economic position at present. Pakistan's main imports are cotton goods, machinery, and vehicles. India's chief exports are manufactured jute, cotton goods, and tea, and her imports machinery, food grains (rice and wheat), raw

cotton, and petroleum. It will be seen therefore that the economies of India and Pakistan are to a considerable extent complementary, and it is to be hoped that the future will see a dying down of the political and religious antagonisms which at present hamper economic co-operation.



Above: THE KHYBER PASS. (Fox Photos.)

Below: A MANGANESE MINE IN SOUTHERN INDIA. (Exclusive News Agency.)



ABOVE: PAPUA. PREGNANT WITH OXEN. (Exclusive News Agency.)

Below: A woman in a village. The oxen are threshing the rice by trampling

CHAPTER VIII

THE REPUBLIC OF INDIA

The Republic of India remains in the British Commonwealth of Nations although not recognising the sovereignty of the Queen, but accepting her as "the Symbol of the free association of its independent member nations and, as such, the Head of the Commonwealth." It consists of the whole of the peninsula, and also includes the greater part of the Ganges Lowlands, the eastern half of the Punjab (see Figs. 23 and 28).

STATES OF THE REPUBLIC OF INDIA

STATE	AREA (sq. miles)	POPULATION 1966 (millions)	DENSITY per sq. mile	LANGUAGE
Punjab ..	21,630	11.4	521	Punjabi (Sikh) and Hindi
Rajasthan ..	132,152	20.2	153	Rajasthani and Hindi
Uttar Pradesh ..	113,654	73.7	649	Hindi
Bihar ..	67,196	46.5	691	Hindi
West Bengal ..	33,829	34.9	1,032	Bengali
Assam ..	78,529	12.2	155	Assamese and Bengali
Orissa ..	60,164	11.5	292	Oniya
Madhya Pradesh	171,217	32.4	189	Hindi
Andhra Pradesh ..	106,286	36.0	339	Telugu
Madras ..	50,331	33.7	669	Tamil
Kerala ..	15,002	16.9	1,127	Malayalam
Mysore ..	74,210	23.6	318	Kannada
Maharashtra ..	118,717	39.6	333	Marathi
Gujerat ..	72,245	20.6	286	Gujerati
Kashmir ..	86,023	3.6	42	Kishmiri
Haryana ..	16,670	7.5	111	Hindi
Nagaland ..	6,360	0.4	59	—
India ..	1,178,995	over 500	424	—

Total Population 1971, 547 million—density 452

for boundaries with Pakistan), together with the provinces of Assam, Manipur, and Tripura in the extreme north-east.

The country is really a federal union of seventeen States, each with a measure of autonomy. Until 1957 there were thirty States more or less coinciding with those of British India. The reorganisation was due to the fact that the original State boundaries took little account of the racial and linguistic subdivisions. The change was not effected without bitter opposition, especially in the city of Bombay. There are also ten Territories, including the capital, Delhi; Manipur on the

Burmese border; Tripura, east of the Brahmaputra delta; Himachal Pradesh in the extreme north-east; the Andaman and Nicobar Islands and Goa, Daman, and Diu, formerly Portuguese possessions. The Table on page 97 shows the areas and populations of the States.

A danger facing India is that States based on linguistic divisions, whose people cannot speak to fellow-Indians because they have no common language, may attempt to secede.

India has more or less completed her first three Five Year Plans. The main object of the first was to provide greatly increased food supplies by improving and expanding irrigation, and that of the second was to develop industries, especially in iron and steel and heavy machinery. The output of steel is now over 7 million tons. The emphasis of the third Five Year Plan which began in 1961 was again on agriculture in an effort to triple yields per acre not only by further irrigation schemes but also by instruction in better water management, the provision of seeds and fertilisers, and the use of simple tractors. Much increased yields have come from Mexican wheat and "miracle" rice. The irrigated area is over 80 million acres, the yield has increased by 3½ times, the area under rice has increased 25 per cent. In some areas there are four crops a year, rice and vegetables in summer, wheat and vegetables in winter. Maize and millet production has much increased. India is the world's largest producer of ground-nuts and tea, and is second of rice, jute, raw sugar, rape seed, sesamum and cas.

	1950	1967	some 1970 figs.
Food (million tons)	33	68	72
Seedlings (million)	2	6	6.5
Irrig. area (million tons)	3	23	30
Sulphuric acid (1,000)	101	664	1,200
Nitrogenous fertiliser	9	233	751
Railway wagons (m)	2,000	33,500	
Aluminium (tons)	4,000	65,000	125,000
Cotton cloth (million m)	42	74	
Oil (million tons)	1.1	3.6	4.3
Oil (1,000 kilograms)	227	367	
Trucks (number) ..	99,000	1,581,000	1,954,000
Tractors (number) ..	54,000	500,000	1,456,000
Scars (machines) (number) ..	33,000	432,000	
Electricity (number) ..	13,000	1,500,000	
Watches and clocks (number)	Nil	450,000	
Motor vehicles (number) ..	16,500	68,500	

Since 1950 industrial production has increased by 160 per cent. The table shows growth between 1950 and 1967.

The country may be divided into the following regions: (1) the Peninsula; (2) the Ganges Lowland; (3) the Mountain rim of the north and east.

(1) THE PENINSULA

The Western Coastal Area

Flanking the entire western shore there is a very narrow coastal ledge between the Arabian Sea and the Western Ghats. Indeed, this coastal ledge is not really continuous because in places low spurs from the Ghats reach the sea in high cliffs. The whole of the region is exposed to the full force of the summer south-west monsoon so that there is a heavy rainfall. During that season conditions are very similar to those of the Equatorial lowlands with the result that the natural vegetation is a dense and luxuriant jungle, despite the winter drought. Much of this forest has been cleared and the region now supports almost as many people per square mile as does the Lower Ganges Basin. The great majority get their living by cultivating such crops as rice, cane-sugar, mangoes, and chillies—the two latter being ingredients of chutney, made in Kerala. Rubber is produced in Kerala, in the extreme south, Bombay.

An interesting product in this area is lemon-grass, which yields citrus-oil (75 per cent. of world production). Kerala also produces the largest amount of thorium (monazitic sand) and there is an aluminium industry. It is one of the most over-crowded parts of India, and to alleviate matters the 340 square mile salt-water lagoon of Kuttanad, immediately south of the port of Cochin, has been drained. This has added 120,000 acres of cultivable land, which bears two crops a year and adds 60,000 tons of rice to the annual output. It has also aided flood control and improved communications. Coconuts are an important product along the shores of Kerala, and here, too, there are many fishing villages.

In the extreme north-west the coastal lowland widens considerably to form the island of Kutch and the Kathiawar Peninsula. The former is separated from the mainland by the Rann of Kutch, a salt swamp once an area of the sea which has been partially raised. During the summer rains it

forms into shallow lakes, but in the dry season it becomes a desert from whose salt pans valuable supplies are obtained. The island is undulating, with two ridges of hills reaching about 900 ft. Its climate is a transition between that of the heavy rainfall area to the south and the dry Lower Indus Basin. The chief crops, as also in the Kathiawar Peninsula, are cotton, millet, and wheat. Ahmedabad has a very important cotton industry.

At Anklesvan on the Narbada estuary petroleum production is now about 1 million tons a year. Near Surat, at Karakpur

on the River Tapti, a weir over 2,000 ft. long and 150 ft. in height feeds 850 miles of canals and irrigates 650,000 acres. It is estimated that food grains have been increased by 160,000 tons and cotton by 15,000. Baroda has a chemical industry.

Bombay (population 4,150,000) is the second largest city of India. It did not begin to rival Calcutta until the opening of the Suez canal in 1878, when, owing to its position nearly

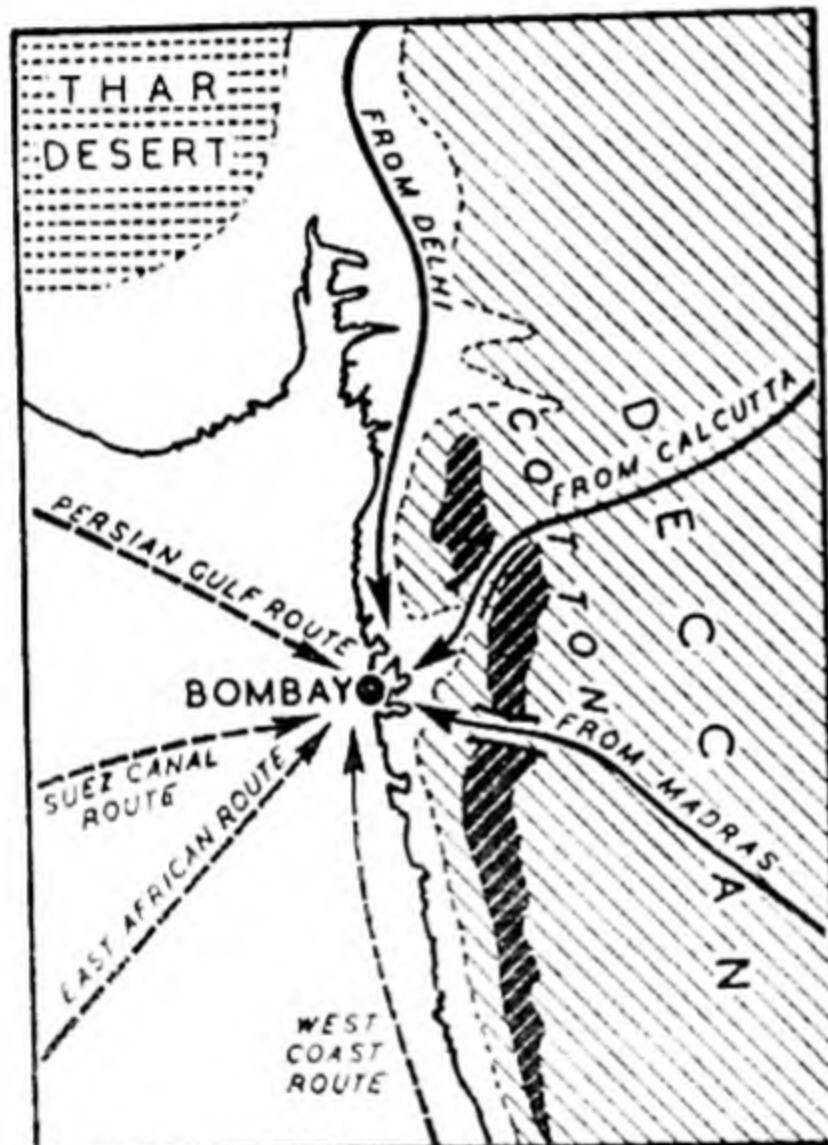


Fig. 26. SITUATION OF BOMBAY.

opposite the outlet of the Red Sea, it became the chief passenger and mail port of India. Prior to this Calcutta had handled most of this traffic, as the sailing ships which rounded the Cape of Good Hope took advantage of the "Brave West Winds" by sailing far to the eastwards before making their rounding and so approached the east coast of India. The immediate hinterland of Bombay is very restricted, but the port has good access to all parts of the country and to the other great cities, to which it is linked by a network of modern

railways. Thus, one line passes northwards along the coastal plain through Surat and then runs between the Aravalli Hills and Thar Desert to Delhi. A second one goes to the north-east and climbs the steep western edge of the plateau by the Thal Ghat (Ghat means Gate or Pass), and then makes use of the Narbada trough between the Vindhya Range and Mahadeo Hills. It reaches the Ganges at Allahabad and follows the valley to Calcutta. The third climbs through the Bhor Ghat to Poona, Bombay's hill-station, and then crosses the Deccan to Madras.

Bombay (6,000,000) is situated on the outer and smaller of two islands. Railway and road bridges link it with Salsette Island and thence with the mainland. The harbour to the east is well sheltered from the south-west monsoon. A new out-port, Nhara Shera, is being built to handle container cargoes.

One of the outstanding elements of Bombay's population is the Parsee. These Parsees are descendants of refugees who fled from Persia because they would not desert their fire-worshipping religion for Islam. Many of them are wealthy merchants, some of whom have invested their money in cotton mills. Cheap quality cotton goods are made from coarse short-stapled cotton grown on the Deccan and in Uganda. Power from the swift streams of the Western Ghats drives the machinery. There are also engineering works of some importance. Recent industrial developments include blast furnaces (Krupps), oil refineries, tobacco factories, glass and chemical works, plastics, cycle and car assembly industries. Bombay also has a large fishing fleet.

The other towns are by no means so important as Bombay, serving only as local ports. Note that there is no railway southwards from Bombay, the fairly extensive trade being carried out by coastal shipping. Goa was a relic of the Portuguese Indian Empire. Many of its people are half-castes and many of them work as stewards on passenger liners and as clerks in Bombay. Goa exports coconut products and cashew nuts. Salt-pans are numerous and manganese is mined near Mormugao. The population is 640,000. Calicut deserves mention because it was the first port reached by Vasco da Gama and because it has given its name to the fine cloth (calico) originally made there.

The Deccan

As has already been stated, the Deccan is a massif of ancient rock which has been tilted from west to east. The great escarpment of the Western Ghats, which overlooks the coastland lowland, rises from about 2,000 ft. in the north to the Nilgiri Hills in the extreme south, where Mount Dodabetta is 8,760 ft. above sea-level. These Ghats are composed mainly of volcanic trap which welled up along the line of weakness formed by the tilted edge of the massif. They have been deeply dissected by many short and swift rivers which flow down to the Arabian Sea. In the northern part, from the top of the escarpment and extending for about 20 miles inland, there is a wild and barren area of mesas and razor-edged ridges, separated from each other by deep gorges cut by rivers which flow eastwards to the Bay of Bengal. The valleys of some of the main streams are wider, but provide many examples of incised meanders—a sign of rejuvenation of the rivers through the renewed rising of the massif after they had reached maturity. There is evidence of three separate rejuvenations, because several of the mesas have three steps cut into their edges. Still further inland the countryside becomes flat, with occasional low scarps and outcrops of volcanic rock which run at right angles to the Ghats where fractures in the massif allowed lava to well up to the surface. The soil is brown with patches of black. Further south, largely because of the greatly increased rainfall, itself a result of the higher altitude, the Ghats and their hinterland are covered by quite thick forest, but the relief features remain very much the same. For a description of the relief of the Deccan, refer to page 86.

The natural vegetation is, in the main, poor grassland, but towards the south, where the rainfall is higher, there are more trees, especially tamarinds and banians. A very large proportion of the Deccan has, however, been brought under cultivation by irrigation, so that when flying over it one gains the impression of a series of patchwork quilts (the multi-coloured small fields with a variety of crops) separated from each other by empty spaces (barren areas, usually outcrops of volcanic origin).

The north-western part of the Deccan, together with the Indian section of the Thar Desert, belongs to the second largest Indian State, Rajasthan, which has an area of 132,000 square miles and a population of 20 million (average density per square mile: 151).

Much of the Deccan in this State is barren, having a sandy soil and low rainfall. Irrigation is mainly carried out from wells, but crops are also grown in the beds of dried-up rivers in winter. Over the countryside there are many drought-resisting trees and shrubs, *e.g.* thorn-bushes. On the non-irrigated land camels, cattle, sheep, and goats are reared. The capital is Jaipur, a hilltop market town used by tourists visiting the even higher deserted city of Amber, the former stronghold of the Maharajahs. Along the northern edge, overlooking the Punjab, copper mining is being developed.

That part of the Deccan which forms the hinterland of Bombay has a covering of laterite of volcanic origin. The soil is a heavy clay which retains the moisture. Cotton seed is sown thinly, each one forming a ball of clay around its roots, thus securing an adequate share of moisture. The disadvantage is that shallow-rooted weeds quickly spring up

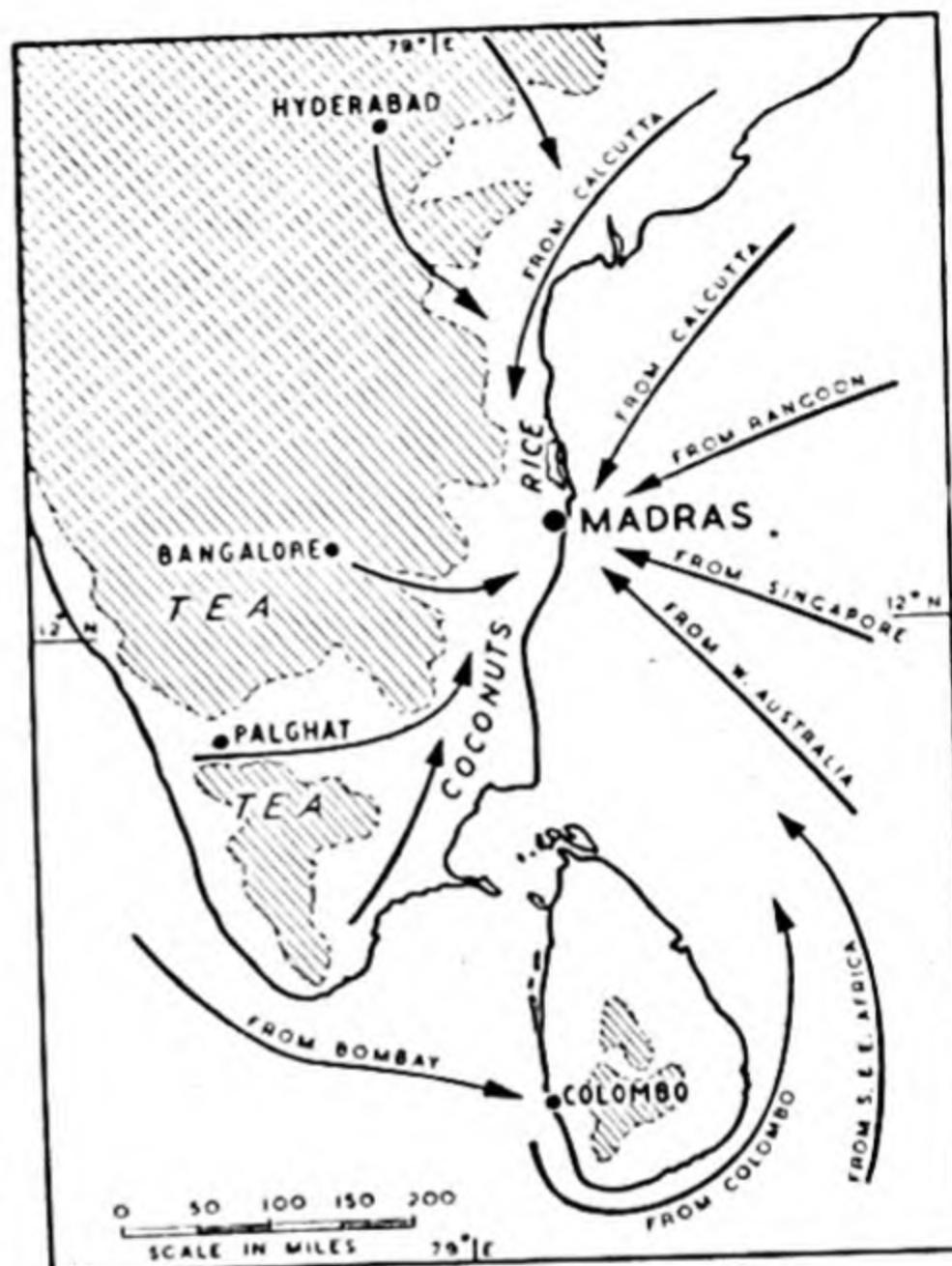


Fig. 27. MADRAS—CHIEF COMMERCIAL AND POLITICAL CENTRE OF SOUTH-EAST AND SOUTH-WEST INDIA.

Note the importance of Palghat.

Along the northern edge, overlooking the Punjab, copper mining is being developed.

and tend to choke the plants, reducing the yield. The cotton is short stapled and coarse, but elaborate cultivation would increase the cost of production, and the native industry requires cheap cotton which is all that the Indian masses can afford. The rainfall is sufficient for cotton to be grown in this way without irrigation (Aurangabad area: 24-35 in.). Most of the cotton is sent to mills in Bombay.

Poona (100,000) was a hill-station for the British living in Bombay, but is now mainly an educational centre. Aurangabad (population 66,000) is a market town and tourist centre, being within easy reach of the Ajanta and Ellora "Caves". These are man-made excavations and acted as temples to Hindu, Jain, and Buddhist deities. The town has cotton and metal industries (copper, lead, and silver). Over the whole of this area millet is the chief crop, irrigated from artesian wells.

To the east and south-east of this area, occupying most of the States of Madhya Pradesh, Andhra Pradesh, and Northern Mysore, the Rivers Mahanadi and Krishna have eroded their basin and the land is relatively flat, apart from the watershed area and isolated outcrops of harder rock. It is crossed by numerous tributaries which in the winter look like "wadis", and a short distance from the outcrops springs well up, often in the middle of a field. Over the whole of this central and eastern region the tributaries of the great rivers have been ponded back by primitive mud and brushwood dams to form simple reservoirs for irrigation and drinking water. There are so many of these that a map showing them gives the impression that each stream consists of a string of lakes. These primitive systems are being replaced by more modern methods. Thus, on the Tungabhadra tributary of the Krishna (Kistna River) 700,000 acres have been irrigated by canals, and on the main river itself the Nargarjunasagar Dam provides power and irrigation water over a wide area. The main crop is millet, for the rainfall (less than 40 in.) is too little for rice-growing. Cotton is widely grown and is spun and woven at Nagpur, Jubbulpore, and Hyderabad. Near Hyderabad the toddy-palm yields a juice which provides a popular alcoholic drink. This is a State monopoly and an important source of revenue. The leaf stalks yield kittul fibre for brooms. Hyderabad (population over 1 million) is the

capital of Andhra Pradesh, which extends over a wide area of the coastal lowlands as well as the Deccan.

To the north of its coastal area another State, Orissa, also encroaches on to a part of the Deccan, a part of the Mahanadi Basin. Here the most ambitious irrigation scheme of the Deccan has been completed by the building of the Hirakud Dam and Reservoir. The dam is the longest in the world (three miles) and 2 million acres have been irrigated and 200,000 kWh. of electricity provided. Aluminium is smelted at Hirakud. A few miles to the north-east, at Rourkela, in the same State, great works have been built with German help to produce three-quarters of a million tons of finished metallurgical products, *e.g.* tinplate and galvanised sheets. This is the beginning of the greatest industrial belt of the Deccan; indeed, of the whole of India. One hundred miles west of Rourkela, on the Calcutta-Bombay railway, the Russians have assisted in building a plant at Bhilai to produce rails, sleepers, and structural steel. In the extreme north-east corner of the Deccan there are the more important development areas. Near Jamshedpur there is the largest coal-field in India, which has a total annual output of 40 million tons from all its fields, one-fifth of that of Britain. Here at Jamshedpur are the largest iron and steel works in the Commonwealth outside the United Kingdom, producing over 1 million tons of steel ingots and three-quarters of a million tons of steel. This output is being greatly increased. The whole enterprise was developed by the Tata family, Parsees from Bombay. To house the workers a new suburb of Jamshedpur, Tatanagar, was added, and the total population is over 300,000. To the north-east at Ranchi machinery and machine tools are made. Manganese and iron are mined locally for these and the other iron and steel industries.

The southern part of the Deccan is shared by the States of Mysore and Madras, and is drained mainly by the Cauvery River. Here the land is much higher and more undulating and the rivers are swifter. Hence there are several reservoirs for hydro-electricity and a well-planned irrigation system. In the area between Bangalore and Mysore there are large expanses of red soil intersected by volcanic outcrops. Here irrigation is by wells, a few using modern pumping machinery

but most still by manpower or by the humped zebu cattle. Incidentally, there are millions of these spread over the whole of India, but they are undernourished and used mainly for draught purposes. Their dung is the chief fuel for cooking. It is a common sight to see women bearing pyramids of these "pats" making their way to the nearest village on market day. The reason why the animals are in such poor condition is that the pressure of the human population is so great (many of these are also undernourished) that there is little room for pasture or fodder crops. The chief crops are rice (on terraced fields), sugar, tobacco, millet, and fruits, especially limes, bananas, tangerines, oranges, grapes, mulberries, and tamarinds—the last named providing one of the chief ingredients of Worcester sauce. Water-melons are grown in the dried up river beds in winter. In the extreme south, the Nilgiri Hills have many tea plantations, the best quality tea being Orange Pekoe. On the inner side of the Western Ghats, in the Coorg district, most of India's 26,000 tons of coffee (2 per cent. of the world total) is grown.

The most important hydro-electric and irrigation schemes are:—

(1) The Krishnaraga Reservoir to the north-west of the city of Mysore.

(2) The Mettur Dam, over a mile long, in the valley of the Cauvery River in Southern Madras, which ponds back a reservoir of 60 square miles.

(3) In the Coimbatore District of Western Madras, the Lower Periyar Canal, 122 miles long, irrigates over 200,000 acres.

There are manganese and ironstone mines in Western Mysore and the Kolar goldfields to the north-east of Bangalore. Mysore, the former capital, is noted for the great skill of its ivory carvers and workers in sandalwood and rosewood.

In the south-west of the city the heat and rainfall have combined to cause dense forests, and wild elephants are trapped and trained. The forests yield sandal wood, teak, and ivory.

The outstanding town of the Southern Deccan is Bangalore, developed by the British as a hill-station and military headquarters. It has been retained by the Indian Army as its

Southern Headquarters. Bangalore (900,000) has replaced Mysore as State capital mainly because it is a better centre of routes (rail, road, and air) and because of its more suitable climate. It is a rapidly expanding industrial centre, having important aircraft works, textile mills (cotton, wool, and silk), radio and electrical engineering industries, manufacturing of sparking plugs, etc.

The Eastern Coastal Plains

These are much more extensive than those of the west coast, especially where the larger rivers have cut back the edge of the Deccan on the inland side and pushed out great deltas on the seaward. In the extreme south the Cauvery and its tributaries have almost severed the Cardamom Hills from the main plateau, creating the Palghat.

The whole of this area is densely populated and highly cultivated, the principal crops being rice and cane-sugar. The deltas are particularly favourable to the former. In the whole of India there are 80 million acres under rice. As a producer of cane-sugar India is second only to Cuba, but none of it is exported and only about one-quarter is refined and crystallised. Raw sugar in solid form (*gur*) is very popular. The only important mineral wealth is lignite at Neiveli, about 100 miles south of Madras. The annual output is about 2½ million tons. India produces about 300,000 tons of tobacco and the south-eastern area contributes the largest share (42 per cent.).

Most of the people are Tamils, *i.e.* descendants of the original Dravidian people who were pushed further and further south by the "White" Hindus. It was really a "colour bar", which led the Hindus to exclude them from their temples and to keep them at a distance.

Madras (2 million) is the chief city, and the largest railway-coach factory in Asia has been established there. There is also an electronics industry. The port, with an artificial harbour, has declined in importance since the opening of the Suez Canal. Although there is a good railway system along the plain, much of the trade is carried by coast-wise shipping, using a series of ports, *e.g.* Vizakapatnam (where a

ship-building industry has become established), Cocanada, Masulipatam, and Pondicherry. Inland there is another series of towns which may be compared with Cairo, for they are at the heads of deltas and so are bridge towns at the first possible single bridge point as well as being control points of the delta irrigation systems. Good examples are Rajahmundry on the Godavari and Bezwada on the Krishna.

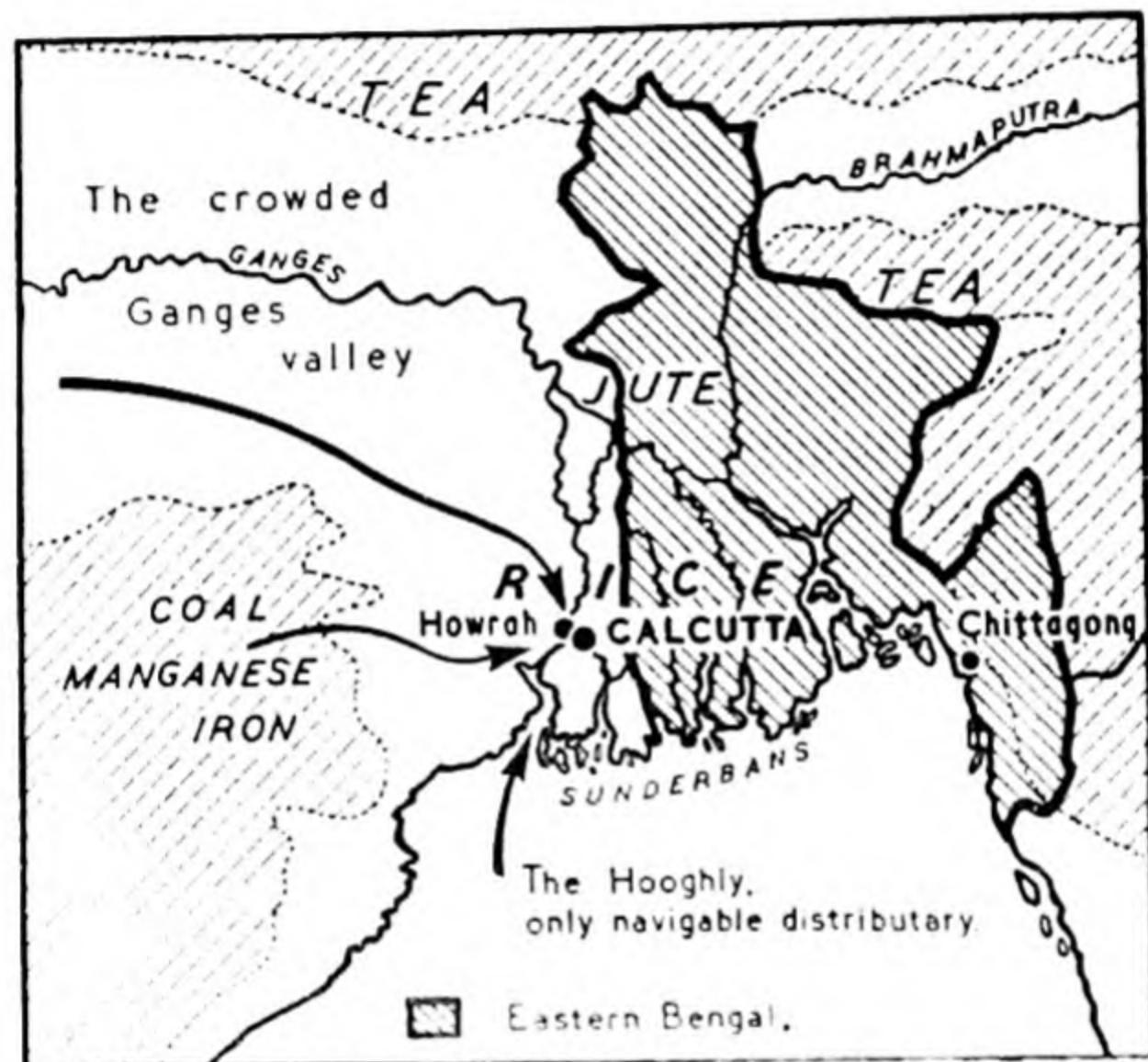


Fig. 28. CALCUTTA—INDIA'S CHIEF CARGO-PORT.

(2) THE GANGES LOWLAND

This synclinal lowland acts as a natural drainage trench into which the waters of the surrounding uplands pour. For this reason most of it is covered with alluvial deposits of great fertility and, provided that there is adequate rainfall or there are facilities for irrigation, relatively high crop yields are obtained.

The Lower Ganges Valley

This includes the smaller part of the Ganges Delta, the greater part of which is included in the territory of

Bangladesh

~~area~~, and the general characteristics are dealt with in the next chapter. The delta land once corresponded roughly with the province of Bengal which had an area of 82,000 square miles and a population of over 60 million, and was one of the "black spots" of inter-racial disturbance, 54 per cent. of its peoples being Moslems and 42 per cent. Hindus.

Calcutta, with a population of 7 million, stands at the limit of navigation of the Hooghly, the most westerly mouth of the Ganges and the only one open to ocean-going shipping. Navigation is very difficult owing to the strong outflow and the frequently shifting mud banks. Haldia is being developed as an outport for container ships. The city owes its great importance to its densely populated hinterland. It is no longer India's greatest passenger port, having lost that distinction to Bombay. Howrah, on the opposite side of the Hooghly, has developed as an industrial centre, with jute mills and steel works. Because of the division of Bengal between India and Pakistan, Calcutta lost part of its hinterland as Pakistan developed Chittagong to serve as the chief outlet for Bengal, particularly for the export of jute. As Eastern Bengal produced 75 per cent. of the total world output it is obvious that the loss of trade in this commodity alone has been a serious one especially when it is remembered that 270,000 workers were employed in the jute mills of Howrah and Calcutta, mainly occupied in converting the jute into sackcloth to be exported to such sack-making centres as Dundee. However, production has been doubled since partition, having reached 5 million bales of 400 lb. each compared with 7 million in Pakistan. Calcutta also has rope works and plastics, aluminium, and engineering works.

A great deal of work has been done to improve the cultivation of a large area in West Bengal and East Bihar. In July 1955, the Mayurakshi Irrigation Project was completed by the opening of the dam at Massanjar. This has been named the Canada Dam in recognition of the aid given under the Colombo Plan. This serves an undulating region of 1,400 square miles, mainly paddy, and irrigates 600,000 acres in the summer and 120,000 acres in the winter. It must be noted that this scheme was devised mainly to improve existing cultivated land and that only about 20,000 acres of

hitherto waste land was brought under the plough. Irrigation should increase the crop-yield by half a ton an acre, *i.e.* 300,000 tons of extra rice and 1 million tons of extra straw. It is by such improvement schemes that the problem of feeding India's rapidly increasing population may be solved. In August 1955, the Durgapur Barrage in the Damodar Valley was completed. This irrigates a further million acres, has increased food production by 340,000 tons, and, like the other barrages mentioned, provided hydro-electric power for industry. At Durgapur a great iron and steel works has been built with British help, to produce three quarters of a million tons a year of railway wheels, axles, and sectional steel. Older works at Kulti have had their production greatly increased.

The Middle Ganges Valley

This valley may be taken to mean the east-west area extending inland as far as Agra. Below Patna the main stream receives only inconsiderable tributaries, but above that city there is a whole series of important ones all flowing for considerable distances from north-west to south-east diagonally across the plain. Thus the Rapti joins at Chapra; the Gomti just below Varanasi, and the Jumna flows in at Allahabad.

This is the part in which there are more large cities than in any other corresponding area of India. They include Kanpur (950,000), Agra (500,000), Lucknow (660,000), Varanasi (Benares, 575,000), and Allahabad (430,000). They are the "market towns" of the densely peopled agricultural lowlands. Here the land is farmed in small holdings by the tenant farmers (ryots) who, in most cases, are struggling to make a poor living and are at the rapacious hands of money-lenders.

In the eastern half (part grown around Patna being indeed, the name "Patna least, wherever it is grown. over 9 million acres und

where the chief crop is rice, that is now applied to the very best, wherever it is grown. Other important crops are maize and oil seeds (summer) and wheat (winter).

The very serious problem in this vast area of Bihar has been the disastrous annual flooding of the great Himalayan tributaries of the Ganges, swollen by the monsoon and the summer

rains, come rushing turbulently down to the plain. As an example let us take the Kosi River which flooded 21,000 square miles and rendered 18 million people homeless, sweeping whole villages away and destroying paddy-fields and mango orchards. It had changed its course frequently, having moved 80 miles westward during the last 200 years. An agreement was reached between the Governments of India and Nepal whereby a joint effort has been made to control the river by building earthen levels and a great barrage. The latter diverts water into four disused channels of the Kosi to the eastward and so serves the double purpose of decreasing its volume and of irrigating 104 million acres. Nepal benefits from flood prevention in the terai belt and the irrigation of 200,000 acres. Perennial irrigation has in this region provided an insurance against the failure of the monsoon rains and has also made it possible to cultivate throughout the year by providing water during the dry winter. In the southern part of this region there are the largest mica resources in the world, the chief mines being at Monghyr and Gaya. Ammonium sulphate, a valuable fertiliser, is manufactured at Sindhri using sulphuric acid made from gypsum from Bihar.

The western half, or "United Provinces" of Agra and Oudh, now called "Uttar Pradesh," is the part where most of the tributaries flow, and in consequence where there is much greater scope for irrigation. Here 12 per cent. of India's tobacco is grown. The most important section from this point of view is the Doab, as the plain between the Ganges and the Jumna is called. This area has been irrigated since 1854 by the Ganges Canal, a fine feat of engineering for those days. It commences at Hardwar where the river leaves the Himalayan foothills and crosses the numerous torrents it encounters by a series of aqueducts, notably that over the Solani which is a quarter of a mile long. The canal is 80 ft. higher than the river. It waters 1,700,000 acres, mainly for sugar, rice, and oilseeds. Recently, the water-power of the weirs has been harnessed at eight hydro-electric stations.

Altogether over 11 million acres are irrigated, partly from wells and partly from canals—the chief of the latter being the Sardis Canal, the longest in the world and irrigating 1.25 million acres. The most recently completed irrigation system

is that of the Sinsi Dam, which is 26 miles from Mirzapur, near Varanasi. Here 100,000 acres are watered from the River Bhakhai which emerges from the Deccan to join the Belan, itself a tributary of the Ganges. There has been a great development of tube-well irrigation in this region, in the Punjab, and in Bihar. There are 10,000 of these wells in the Uttar Pradesh, and recently 2,650 have been added in Bihar. These latter, which tap deep-seated water-bearing strata, have brought 800,000 acres of semi-arid land into cultivation and have added 160,000 tons of food. This Indian system is the largest of its type in the world. In addition there are 26 million acres of non-irrigated land under cultivation. The chief food crop is wheat which is grown in the winter, together with large acreages of curry plant and mustard.

The combined populations of Uttar Pradesh and Bihar exceed 120 million in an area of over 180,000 square miles, or an average of nearly 663 to the square mile. As the area includes unproductive regions, it follows that the density in the fertile parts is greater than 663 to the square mile.

The great cities are on the Ganges or its tributaries. Patna, the capital of Bihar, is situated at the confluence of the Ganges with the Gandah. Varanasi, better known to us as Benares, is in a central position on the Ganges Lowland, and is not only a great junction of routes but is also the most sacred city of the Hindu religion. It is the spot to which all Hindus endeavour to make a pilgrimage, so that they may bathe in the waters of Mother Ganges from the steps of the temple. People suffering from various diseases are brought by relatives in the hope that miraculous cures may be effected, and the ashes of the dead are scattered on the river so that they may be borne to the other world. It has an important brass-ware industry and is visited by large numbers of tourists. Allahabad is at the confluence of the Ganges with its most important tributary, the Jumna. Its name serves to remind us that although the great majority (over 80 per cent.) of the people of India are Hindus there are "islands" of Moslems, so that it is not surprising that there are outbreaks of communal rioting in this area. Lucknow (600,000), the capital of Uttar Pradesh, is on the Gumta tributary. Kanpur (900,000), on the Ganges, is a great textile centre, with cotton, rayon, and

nylon manufactures. Agra (460,000), near the Jumna, is a great tourist centre; the nearby great and beautiful Taj Mahal tomb attracting many thousands of visitors. It has carpet, marble, and saltpetre industries.

The Punjab (India) is that part of the north-west of India which comprises the "saddle" between the Himalayas to the north and the north-western edge of the Deccan to the south. It is really the watershed between the Ganges and Indus river systems and includes the greater part of the basin of the Jumna, chief tributary of the Ganges, and which may be taken as its eastern boundary. In the extreme north it contains part of the basins of the Sutlej, Beas, and Ravi, Indus tributaries which flow through the Pakistan Punjab. Irrigation is essential throughout this area as the annual rainfall is everywhere less than 40 ins. The actual production and system of irrigation is very similar to that of the Pakistan Punjab so that detailed reference is made to them in the next chapter. The chief town is Amritsar (400,000). Jullundur has a major share of the sports' goods industry which its Hindu owners transferred from Sialkot in the Pakistan Punjab. Simla has acted as capital of the Punjab State, but a new town, Chandigarh, has been built to fulfil that function. It is situated in the foothills near Kalka.

In this area many great projects are being carried out to improve irrigation and to bring into cultivation large areas of waste land. One such project of reclamation in the Punjab must suffice as an example. There are some 200,000 acres of hitherto waste land which are now being reclaimed by using tractors to remove bushes and trees. After clearance irrigation channels are dug and tube-wells provide most of the water. The new fields will yield an extra half a million tons of foodstuffs (wheat, barley, grams, and millet).

The greatest of all Indian irrigation and hydro-electric developments is that of Bhakra-Nangal on the Sutlej, north of Delhi, in the foothills of the Himalayas. At Bhakra, where the river flows through a gorge, a dam 740 ft. high has been constructed to pond back a lake 56 miles long and 500 ft. deep. At Nangal, a few miles downstream, another dam has been built, and from this the main canal and its subsidiaries

irrigate 3 million acres of hitherto arid land and develop 1 million kilowatts of electricity. The increase in food is estimated at 1,100,000 tons of grain, 500,000 tons of sugar, 100,000 tons of pulses, as well as 800,000 bales of cotton. Nangal is to have a fertiliser factory with an annual produc-

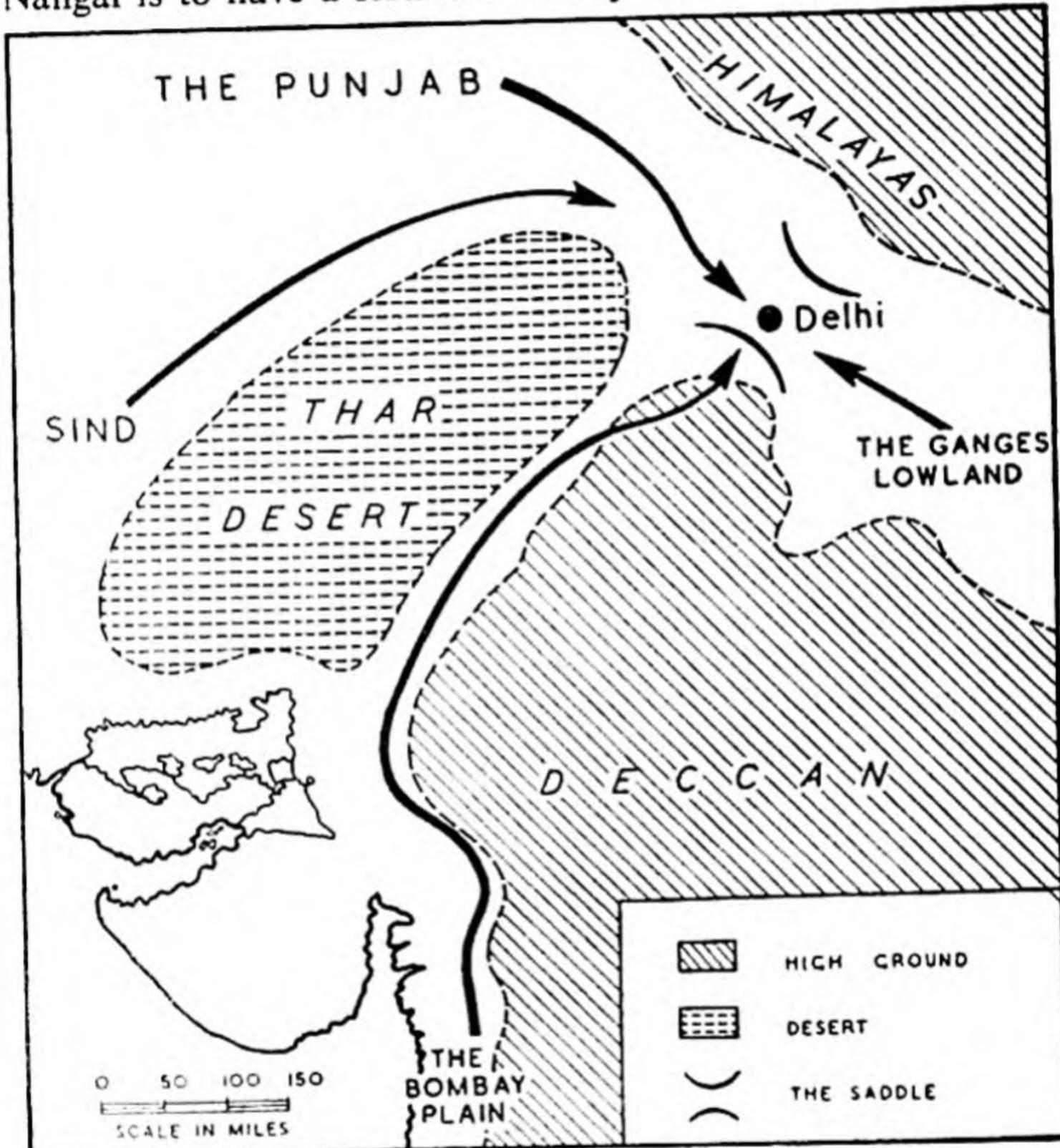


Fig. 29. DELHI.

The natural meeting-place of peoples from three of the four densely-populated areas of the sub-continent.

tion of 400,000 tons. Naturally, this and other schemes for using the Indus tributaries caused much concern in Pakistan, but an agreement has been reached between the countries concerned and the World Bank to utilise hitherto unused waters of the Indus and its western tributaries by leading them by link canals to the affected areas in the east. Both countries are faced with another serious problem in this part of the

Punjab; namely, waterlogging and salinity. When an area has been irrigated for some time, two things may happen: (a) water collects in the subsoil, and (b) salt that has been brought down by the river in small quantities accumulates, as it does in the sea, so that the soil water becomes brackish. To solve the problem much drainage work is being done, using pumps operated by hydro-electric power. In both areas, too, thousands of tube wells are being made to bring water to waste lands which are too far away for irrigation from the rivers. The extreme south of the plain is covered with clay, so that it is liable to summer flooding. The villages are built on mounds above flood-level.

Delhi, the capital of India, owes its importance to its position between the Indus and Ganges Basins on the "saddle" which makes a gateway from the north-west. Old Delhi became the capital of the Moslem invaders, for it stood on the threshold of the fertile Ganges Lowland to the east whilst behind it stretched the more familiar steppe-land of the Punjab. This habit of establishing a capital on the side of the conquered country from which the invaders approached is understandable, for they are in a position either to retreat or to secure reinforcements. Other examples were Pei-ping (Peking), founded by the Manchus when they entered China from the north; Dublin, the English-founded capital of Ireland; and Calcutta, the original English capital of India, which was only replaced by New Delhi when it was felt that if India was to grow towards self-government it must be given a capital more in keeping with its own traditions and in a more convenient position for administrative purposes. It is a natural centre of routes, being linked with Calcutta and the Lower Ganges Basin, the Punjab, and Bombay. The only part of the country with which it is not in easy communication is the Madras region, but there is no other locality where three of the four densely-populated areas can be easily reached. It has an increasingly important cotton industry. Now that the country has been sub-divided it is by no means in a central position but it is very doubtful whether it will lose its position as capital because it has by now become well established as the capital in the minds of the Indians, and it has all the administrative buildings and residential advantages. Its population is 3,500,000.

Not far away to the south-east, a new industrial town, Faridabad, is rapidly developing, with electrical engineering, cement, brick, and railway wagon wheel works, sugar mills, and cycle and cotton industries.

(3) THE MOUNTAIN RIM

We have included those areas of the mountain rim adjacent to India within this chapter even though they may not be territorially part of that country. Thus, Kashmir, whose political future is in dispute, is dealt with here.

A great bulge north-eastwards in the Indian frontier encloses Kashmir with a population of over 4 million. It contains some of the highest and most inaccessible mountain country of Asia in the Karakorams (K2—28,250 ft.). At the extreme north-west corner there is a difficult track known as the Gilgit Road, which links Kashmir with Kashgar, the Central Asiatic caravan centre. It can be kept open only by post-runners in the long seven months of winter when it is often covered with 40 ft. of snow, but Gilgit is now linked with Rawalpindi by air by an often hazardous route along the Indus gorge.

The upper Indus Valley is a stony desert where poor crops of barley are grown by means of a primitive irrigation system, water being carried for long distances by wooden ducts on stone pillars. The entire valley supports a population of only 14,000. By contrast the Happy Valley or Kashmir Plain of the Upper Jhelum is a highly cultivated region. The outstanding products are wool from which the famous Kashmir cloth is made, and apples. Srinagar, the summer capital, is in this valley. In the severe winter the capital is placed at Jammu in the more temperate and sheltered piedmont region of the Upper Chenab. Leh is the only town in the higher eastern part.

Further south-eastwards the southern slopes of the Himalayas are deeply cut by numerous torrential streams, headwaters of the Indus and Ganges tributaries. Next comes Nepal, the independent State inhabited by the sturdy Mongol people, the Gurkhas, who have proved such valuable mercenaries of the Indian and British Armies. The country extends into the Ganges Lowland but most of this part is a dense jungle, often swampy, known as the Terai which, incidentally, extends for a considerable distance along the foothills of the Hima-

layas. Most of the 5½ million people live in the mountain valleys drained by tributaries of the Ganges. The most important town is Katmandu (150,000) which is in the most populous of these valleys, where 30,000 acres are being irrigated for rice. Katmandu is linked to Delhi by air, and in 1960 a motor road was opened between these towns. Wheat, tobacco, opium, and jute are grown and cattle reared. Hides, skins, and clarified butter form the principal exports. The southern forests yield valuable timbers, gums, and resins.

The high valleys along the mountainous eastern Tibetan frontier, mainly in the Solu Khomba district at the foot of Mount Everest, are the home of the Sherpas, who have provided many famous porters to mountaineering expeditions. They rear yaks, taking them up to the high pastures as the snow melts in summer and returning to the sheltered valleys in winter—an example of trans-humance, *i.e.* the seasonal movement of peoples backwards and forwards along a well-marked route, which is distinct from nomadism. The other high frontier valleys are inhabited by many different peoples speaking different languages and often unable to talk to those in neighbouring valleys or even adjacent villages. In Nepal, no fewer than twenty-two languages are spoken.

Next comes a wedge of Indian territory, the southern portion being part of Bengal. On the mountain slopes there are extensive tea gardens facing the gap between the Deccan and Khasi Hills and getting the full benefit of the summer monsoon rains. Darjeeling is the summer hill-station for Calcutta. It is reached by a tiny mountain railway which climbs the steep slopes by numerous zig-zags. Since the departure of British officials Darjeeling, like other summer hill-stations, has declined in importance. Nowadays, Kalimpong, in the valley of the Tista River, is more important. It is the terminus of a route from Tibet over the Natu La Pass (14,000 ft.), little used since the Chinese occupation of Tibet.

The northern section of this territory consists of the Indian Protectorate of Sikkim, which stands between Nepal and Bhutan. There are only about 160,000 inhabitants in an area of just under 3,000 square miles. Most of the people are Nepalese who have driven the original Lepchas into the jungles and occupied the better lands for themselves. The country is a

succession of narrow steep-sided valleys which have been carefully terraced and irrigated to produce rice, oranges, maize, and millet. The mountain slopes are in the lower parts densely forested but higher up the vegetation is more open with larch and rhododendrons. In one part at 9,000 ft. extensive apple orchards have been planted by the Maharajah and the fruit is exported. As the height increases so the snow line is reached and in the extreme north towers Mount Kanchenjunga (28,150 ft.). India has recently built a network of roads to supplement the ancient highway which bears the trade between Tibet and Bengal. It follows the valley of the Tista River, which after leaving the capital, Gangtok, becomes such a narrow ravine that only a mule track is possible. Finally, over the highest northern part where it rises to over 17,000 ft., yaks are used. Wool is the chief commodity reaching the outside world by this route.

Bhutan is a country which is independent but is granted a subsidy and advised on external relations by the Indian Government. As in Tibet the priests have a great influence. Products are similar to those of Sikkim. Until recently, Bhutan was isolated, but a motor road has now been built.

Assam forms a triangular wedge driving into the north-eastern corner of India with a broad base abutting on Bengal. It consists of five main regions, viz. (1) the eastern extremity of the Himalayas in the north; (2) the Brahmaputra Valley; (3) the Khasi Hills; (4) the Surma Valley; and (5) the eastern ranges known in succession as the Patkai, Naga and Lushei Hills, and in Burma as the Arakan Yoma.

The Brahmaputra Valley is the most densely populated part of Assam producing large crops of rice and jute. The foothill country along its northern edge is a tea planting area known as the Dooars. It yields about 140 million pounds of tea annually. In the eastern part of the valley oil is mined, being refined at Digboi and Gauhati. Mountain tribesmen come down to the edge of the plain to graze their cattle in winter, driving them back into the mountains in summer. This is another example of transhumance.

North-east of the Ganges Delta in the Tripura and Cachar areas is the largest tea planting area of India, yielding about 350 million lbs. annually: about half of the national crop.

CHAPTER IX

PAKISTAN AND BANGLADESH

The Republic of Pakistan consists of the greater part of the Indus basin together with Baluchistan in the South-West. The population of 55 million is predominantly Moslem.

Bangladesh (formerly East Pakistan)

As a result of the Indo-Pakistan war of autumn 1971 the former East Pakistan has become the independent republic of Bangladesh.

Bangladesh has an area of 55,000 square miles and a population of 65 million. The enormous Ganges delta consists of hundreds of channels which are always changing course owing to the absolute flatness. Often this leads to great hardship, for the rivers form the boundaries of property and owners are ruined should their land be affected adversely. Law suits as to the ownership of land are common. Along the seaward margin are the Sunderbans, a belt of mangrove swamps uninhabited by man. The mangrove trees, which support themselves in loose mud by sending branches down to take root, yield tannic acid from their bark. The delta forms one vast farmland, rice being the most common crop, but jute the most distinctive. Rice is cultivated on over 20 million acres which is almost three-quarters of the total cultivated area. There are about two million acres under jute yielding two-thirds of the world's total production. The average annual production is over a million tons. About half of it is sent to great new mills, e.g. at Narayanganj, south of Dacca, to produce about 107,000 tons of woven jute, three-quarters of which is exported, largely to Dundee for manufacture into various kinds of sacks. The remainder of the raw jute is exported to U.K., India, U.S.A., China, and Japan.

Northwards of the delta there is a belt of lowland between the north-eastern corner of the Deccan and the Khasi Hills

which, for the Indo-Gangetic Plain, is remarkably free from rivers. The Ganges edges round the western end and the Brahmaputra the eastern. The summer monsoon blows through the gap and spreads the heavy rainfall northwards to the Himalayas. This area is less densely populated and has poorer communications than any other part of the Ganges Lowland. The opium poppy used to be an important product but prohibition of the export of opium to China for smoking has greatly curtailed its cultivation, which is now carried on solely to supply medical needs.

Tea is the other main cash-crop. It is cultivated mainly in the lower foothills of the Khasi Hills near Sylhet and also in the hinterland of Chittagong. There are nearly 80,000 acres producing over 50 million lb., of which about one-quarter is exported, U.K. being the chief customer. Pine-apples are also an important product.

Other important crops are pulses, oil seeds, chillies, grams, and over 3 million tons of sugar-cane, as well as tobacco, hemp, wheat, and barley. Forest products are important, yielding about 15 million cubic feet of timber as well as millions of bamboos used in the paper industry at Chandragona, now producing 12,000 tons annually. There is a news-print industry at Khulna on the Ganges Delta, which uses gewa wood from the Sunderbans.

All aspects of living are dependent on the rivers which provide the chief means of transport. During the rainy season people travel over the flooded fields from village to village. Several types of boat are used, the most common being the ghasi which holds five passengers. The largest are the panchis which are used for carrying jute and rice, and the smallest are the dinghis which have given us the word for rowing boats carried by larger vessels. An air-bus service has been started, and this will greatly speed up communications and help to improve the pitifully low standard of living in this region. ~~where~~

Great attention has been paid to the improvement of navigation and roads and railways are being built. A great deal of fishing is carried on by means of nets and bamboo traps. It is estimated that over 1 million tons of river fish are caught annually.

The only considerable towns in Bangladesh are Dacca (560,000) and Chittagong (360,000). The former is the provincial capital and is noted for its muslins. The latter, well to the east of the combined delta of the Ganges and Brahmaputra has increased considerably in importance since the partition, as it has been developed as a port at the expense of Calcutta, particularly for the export of jute. Amongst other things this entailed the replanning of much of the railway system because, naturally it had hitherto centred on Calcutta. Its annual cargo capacity has been quadrupled and is now 2 million tons. It has a large glass industry and a steel mill. Its immediate hinterland consists of Hill Tracts which are inhabited by the primitive Maroong tribes, who follow a semi-nomadic life cultivating patches of cleared forest for crops of rice, cotton, and pumpkins. When the soil is exhausted they move on to make another clearing. The forests yield teak and bamboo. In this area, hydro-electricity is being generated at Kaptai. Khulna has been developed as an outlet for the Brahmaputra Valley and has an annual cargo capacity of half a million tons. The exploitation of natural gas in the Sylhet area should do much to aid the industrial development of Bangladesh, so that these ports should continue to increase in importance.

The Punjab (Pakistan) and Bhawalpur

As the annual rainfall is here less than 20 in., nearly all of which falls in summer, apart from occasional "Mediterranean" storms in winter, irrigation is essential. Fortunately, the river system lends itself to the canal method of irrigation, for the five rivers converge towards the south-west, draining a huge fan-shaped area—the open end of the "fan" being to the north-east. Briefly, the layout of the canal system is another "fan" of major or trunk canals opening out from N.E. to S.W. and superimposed over the natural waterways. These main canals are linked by minor ones which in turn feed water into the irrigation ditches. The rivers are dammed as they leave the mountain rim, the sluices being open during the summer rains but closed to pond back the water during

the dry winters. There are now 17½ million acres of irrigated land, which accounts for the fact that what was less than a century ago a sparsely-populated steppe-land now supports a



Fig. 30. THE PUNJAB AND THE NORTH-WEST FRONTIER.

population of 29 millions, a density of nearly 300 to the square mile. As already stated, an agreement has been reached with India to bring the hitherto unused waters of the Indus, together with those of the Jhelum and Chenab to the south-east of

Pakistan Punjab, to replace that lost through the development of the new irrigation systems in the Indian Punjab. This has necessitated the re-modelling of much of the existing irrigation system. The Ghulam Mohammad, Gudda, and Taunsa Barrages, all on the Indus, will irrigate 6½ million acres; another barrage on the Jhelum will provide irrigation water for a further large area. A very great problem is waterlogging which has been caused by the accumulation of unused irrigation water where the water-table is shallow. To remedy this thousands of tube-wells have been sunk to pump the water to the surface to aid irrigation. By this means it is hoped to reclaim 2,800,000 acres of abandoned agricultural land mainly in the Chaj Doab between the Jhelum and the Chenab and the Rechna Doab between the Chenab and the Ravi.

By far the most important crop is winter wheat, with an acreage of over 10 million and a yield of over 3 million tons. Sunny days with temperatures well into the 60's are ideal for this. Other winter crops are gram (1½ million acres) which resembles peas and is dried, barley, and mustard. Altogether, food crops account for over two-thirds of the cultivated area (over 19 million acres), summer crops being bajra, a variety of millet (1½ million acres), maize (½ million acres), and rice (900,000 acres). The chief non-food crop is cotton, grown in the summer on 1½ million acres, with a yield of about 150,000 tons. It is long-stapled and of much better quality than that grown on the Deccan. Sugar-cane is another important crop.

In the extreme North-West Punjab the Thal Desert is being irrigated to bring 2 million acres of its total area of 2,000 square miles under cultivation. This is also a promising mineral area. Near Islamabad (340,000), the capital of Pakistan, petroleum production is increasing. The extensive Salt Range yields 170,000 tons of salt annually.

The provincial capital, Lahore (population 1,300,000) is situated in the north-eastern area and is the control point of the irrigation system. In the south-west is Multan (190,000). Sialkot is an important centre for the manufacture of sports' goods, many cricket balls and footballs being exported to Britain. Cotton, woollen, and rayon industries are growing.

The Lower Indus Valley, or Sind

This valley is a region very much akin to Egypt or Iraq. Indeed, it is known to have been the home of a civilisation exhibiting many of the features of those of the other two riverain lands and flourishing about 3000 B.C. There is evidence of trade between the Tigris and Indus Lowlands, for Sumerian seals have been found in the ruins of Mohenjo-daro and the

Babylonian word for cotton was *Sindha*, Indian cotton being grown in the gardens of Nineveh.

In a region where the rainfall is less than 5 in. and the summertime day temperatures often exceed 110° F., it is obvious that the Indus must have a big part to play in any development scheme. Until recently the whole of the area was a land of thorn-bush and jungle-grass near the river, with areas of desert further away extending into the Thar of Rajputan and which covers the region to the eastwards nearly as far as the Aravalli Hills. Much of the area is still very primitive, with water-

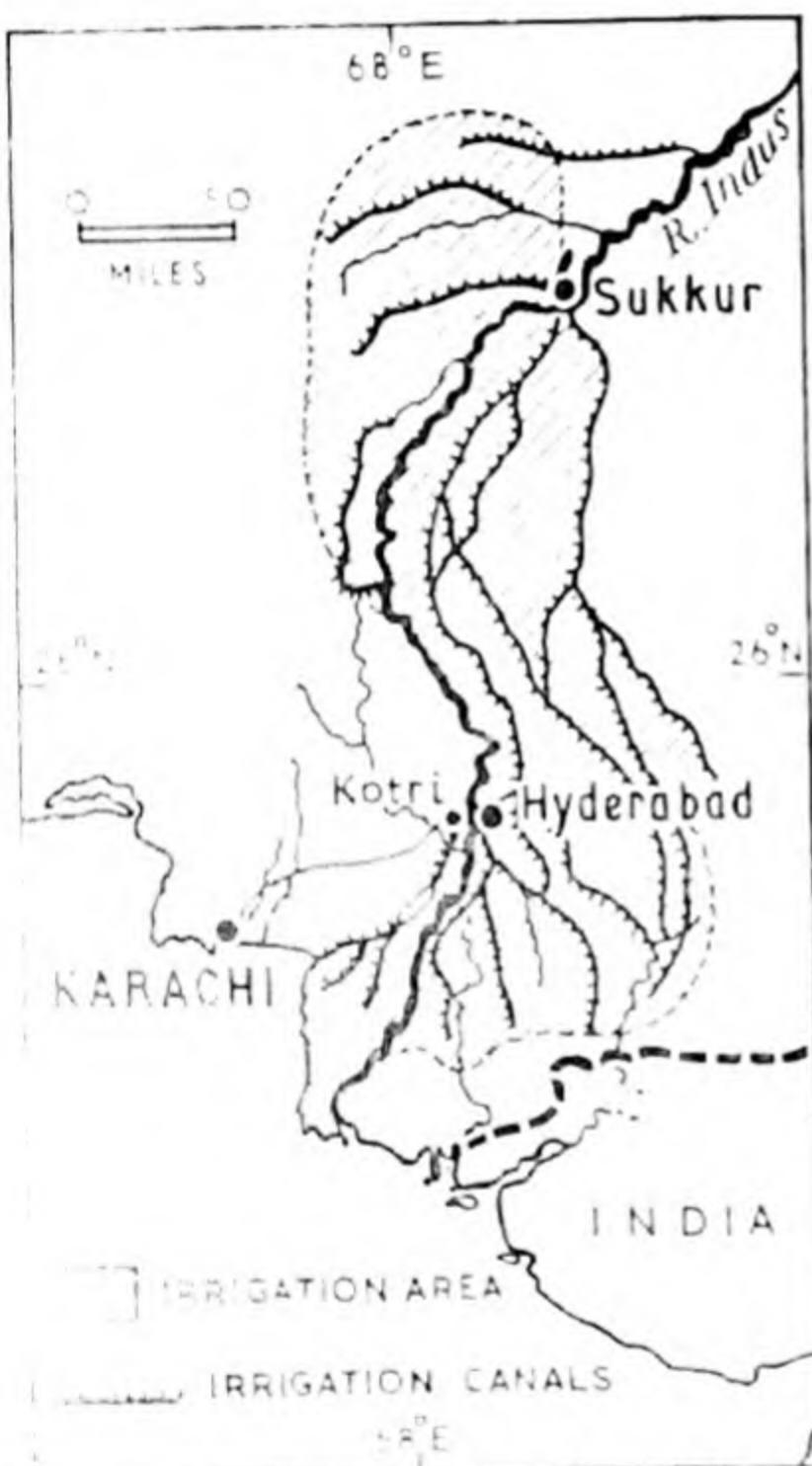


Fig. 31. SIND IRRIGATION AREA.

sheels worked by oxen, and camels as the chief means of transport.

The Indus is not so easy to control as the Nile, and in the summer flood it tends to change its course, but an effort has been made to check this by planting trees. The most ambitious irrigation scheme in Pakistan was completed in

1962. In 1955 the Kotri Barrage in Lower Sind was opened. It feeds four canals and will irrigate 2½ million acres. Already 3½ million acres have been brought into cultivation by means of the Lloyd Barrage at Sukkur, which will ultimately irrigate 5½ million acres. It is nearly a mile long and has 66 arches. From it four canals lead off from the left bank and three from the right. The main winter crop is wheat, which has increased from under half a million acres before 1932 to 1½ million acres in 1946. The main summer crop is cotton, which is of the best American Upland quality, *i.e.* long-stapled. A start has been made with the cultivation of Egyptian cotton, which should do well in such similar conditions to those of the Nile Valley. From just under a quarter of a million acres in 1932, the area under cotton increased to one million acres in 1953. In the lower reaches of the river, and on the delta, there are nearly 1½ million acres of rice fields. This is the last area of the Indian sub-continent capable of relieving the pressure of population, so that it may be expected to fill up quite quickly. Sind is one of the healthiest regions of Asia, for its death-rate is only 11 per 1,000 compared with 23 per 1,000 for the whole of India. In Sind there has been a large-scale revival of homespun cotton and woollen cloth production as well as the development of factories. The number of spindles rose from 410,000 in 1953 to 1,830,000 in 1957, and looms from 4,800 to 27,800. These increases may be attributed largely to the influx of Moslem business men from Bombay. The tendency is for the industry, including ginning, to be scattered about the cotton-growing area using the new sources of supply of hydro-electricity generated from the irrigation dams. Many large estate owners maintain ginning factories where their land-workers may be employed after the cotton has been picked and there is little outside work for them to do. About half the raw cotton is now spun and woven in Pakistan, the remainder being exported mainly to Japan. Some of the finished cloth is exported, chiefly to U.K. and Belgium.

Karachi, whose population has increased from 400,000 to over 3,000,000 since partition, is by far the most important town in Pakistan and was the capital until 1959. It was not a very obvious choice from the geographical point of view

because it is not central and it is far away from the important Punjab.

Karachi first developed as a military port for troops and stores destined for the North-West Frontier and Baluchistan. It has now become a big exporter of hides, skins, wheat, and flour, as well as having a large salt industry. It is a great airport on the route from Europe to the Far East. Its economic importance is bound to grow as the productivity of the Indus Basin increases. It already has cotton, tobacco, wool, steel, cement, and petro-chemical industries.

THE MOUNTAIN RIM

The western mountains are dry and scrub-covered, supporting only sheep and goats. They are inhabited by such wild tribesmen as the Waziris, who have to be prevented from making periodic forays on to the neighbouring plains in search of booty in the manner of their ancestors. In some of the valleys poor crops of wheat, barley, millet, and lucerne are grown but their outstanding product is fruit, especially peaches, apricots, and grapes.

The North-Western Frontier area is a steppe-land with about 70 people to the square mile. Owing to its strategic importance in the defence of India, most of the British Army in India was stationed there, Peshawar being the chief garrison town as it now is for the Pakistan Army. A caravan route leads to it through the Khyber Pass and traders arrive bearing the goods of Central Asia, which from Peshawar they take to all parts of India. They bring in timber and take out salt, sugar, and paraffin. The province is inhabited by Pathans, and the Pakistan Government has been paying a great deal of attention to economic development, partly for the benefit of the country as a whole and partly to retain the loyalty of the inhabitants by improving their standard of living. Most of the area has been pastoral, apart from specialised cultivation such as in the Parachinar Valley on the western frontier where artemisia, from which santonin, a vermifuge, is extracted and pyrethrum which yields an insecticide are grown. Another crop is saffron, which is used as a medicine and as a colouring matter for food and cloth. New irrigation

and hydro-electric systems are at Kurram Ghari on the Khurram River and at Warsak on the Kabul River where they leave the mountains. The former has improved the irrigation of 129,000 acres and added a further 150,000 acres of irrigated land. The Warsak Scheme irrigates about 120,000 acres and supplies 240,000 kWh. of electricity. A dam which is 650 ft. long and 250 ft. high has ponded back the Kabul River, forming a 26 miles long reservoir. From this the water is taken by high-level canals; that on the right bank by a $3\frac{1}{2}$ mile tunnel through a granite mountain and that on the left by another tunnel through the Mohmand Hills.

In addition, hydro-electric output has been increased on the Upper Saut Canal below Malakand. Irrigation has been much improved in the Peshawar, Bannu, and Mardan areas. There has been a marked increase in the cultivation of the sugar-cane, particularly in the Peshawar Valley, where tobacco and fruit are also important. Industries are being developed, e.g. at Mardan and Charsadda very large sugar mills have been started. There is a woollen industry at Bannu, a high-grade board and paper mill at Nowshera, producing 7,500 tons (there are 350 square miles of forest in the North-West Frontier Province). Nowshera also has a D.D.T. and a caustic soda-chlorine plant, the latter producing 10 tons a day. The Province also has tobacco and fruit canning and preserving factories.

BALUCHISTAN

The province may be divided into five areas:—(1) the North Chagel Hills, forming the border of Afghanistan; (2) the Kharan depression, an enclosed lowland receiving the drainage of the surrounding mountains by streams that lose themselves in the sand or in the salt lake of Makeotag, which occupies the lowest part of the basin in the extreme west; (3) the Central or Sulaiman Range which forms a barrier dividing the country into the north-western and south-eastern sections and through which runs the well-known Bolan Pass connecting Southern Pakistan and Kandahar (Afghanistan); (4) a part of the Indus lowland which forms a wide re-entrant penetrating north-westward towards the Bolan Pass; and (5) the undulating Mekran lowland facing the coast. This area

is drained by several short and swift streams along whose banks are to be found a few inland settlements. The climate is so extreme and the rainfall so light that there are only about 900,000 people in an area of 135,000 square miles. The chief crops are wheat, barley, millet, and fruits. The last named are widely grown, especially grapes, apricots, and peaches. Mekran is important for dates. Sheep rearing is the chief occupation.

Hydro-electricity and irrigation have been developed recently, 1½ million acres having been brought into cultivation. Modern methods of cultivation are being taught, and every year some 3,000 acres of terracing are being added to the cultivated area. Industries are being developed, *e.g.* there is a woollen mill at Harnai making blankets, carpet yarn, and tweeds, and at Quetta there is a factory producing ephedrine, which is a drug extracted from the green stem of the ephedra plant. The most important contribution of the Province to the economy of Pakistan is natural gas from Sui in the eastern borderland, which is piped to Karachi and Hyderabad and as far away as Multan and Lahore. There is an output of over 100 million cubic feet a day, and the whole of the light and power requirements of Karachi are derived from it.

The only important town is Quetta, with a population of 90,000. It is mainly a garrison town in a strategic position on the far side of the Bolan Pass. It is in an area of instability of the earth's crust and is liable to earthquakes.



Above: BURMA. PLOUGHING PADDY FIELDS. (Topical Press.)

Below: TEA-GROWING IN CEYLON—PICKING THE LEAF. (Exclusive News Agency.)



SINGAPORE. River Scene. (Lipkei Press.)

CHAPTER X

CEYLON

This pear-shaped island, a Republic of the British Commonwealth, has an area of 25,000 square miles and a population of 12,500,000, with an annual increase of 2 per cent. This makes the average density of population over 500 to the square mile, the great majority getting a living from agriculture. Of the total population about 8,000,000 are Sinhalese, as the Dravidian natives are called. They are Buddhists, which religion has made far greater headway than in its founder's native country, India. Indeed, the Temple of Buddha's Tooth is visited by pilgrims from all over the Far East—the "tooth" being a great ruby. Tamils form the second largest group, and they also are Dravidians, but they entered Ceylon much later than the Sinhalese. In all, there are over 2,500,000, divided about equally between the Ceylon Tamils and the Indian Tamils. The former are descended from immigrants who came from the mainland some centuries ago and settled in the northern and eastern lowlands. The latter are workers on the tea-plantations of the western hills who were brought to the island in the early 19th Century. Both groups are Hindus and speak Tamil. Ceylon's economic progress is being greatly hampered by industrial disputes, especially in Colombo Docks, and by the uncertainty created by nationalisation schemes.

There are over 700,000 Moors (Arabs), who are chiefly engaged in the coastal shipping trade and are a reminder of

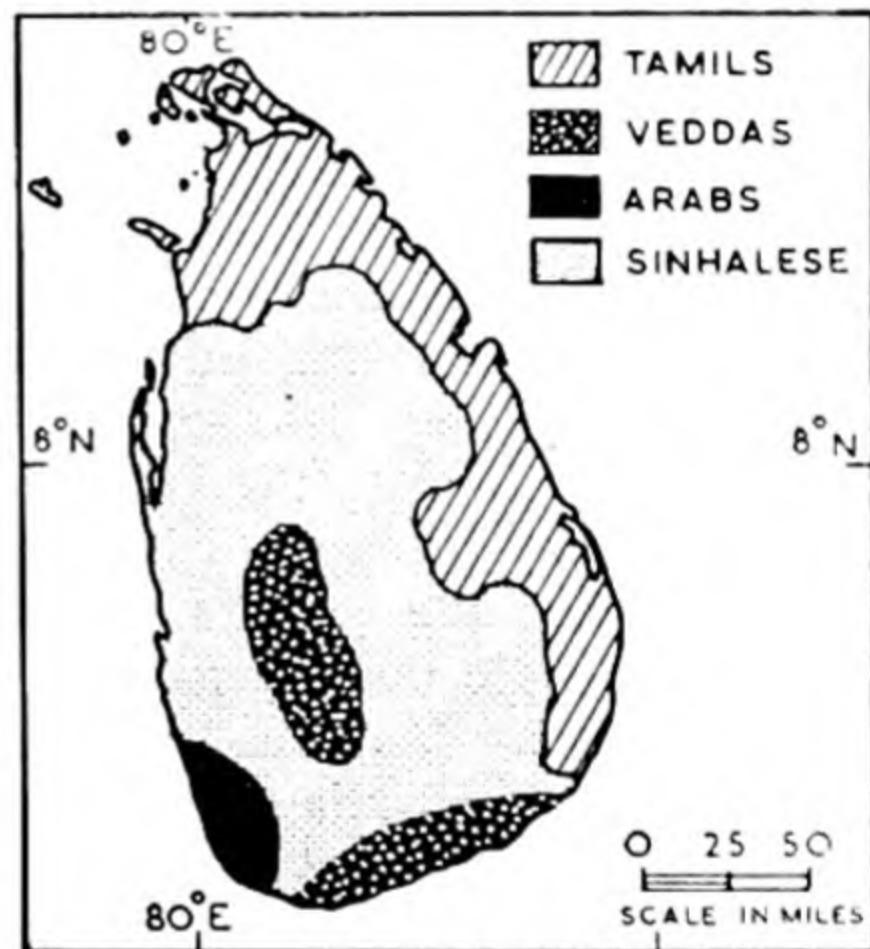


Fig. 31A.

the commercial leadership their ancestors held in the Indian Ocean. They live along the south-west coast. In the south-east are the Veddas (32,000), who are heathen and negroid and whose ancestors reached Ceylon before the Sinhalese. Scattered about the island are some 54,000 Burghers, who are descendants of Portuguese settlers who arrived in 1565 and Dutch who came in 1656. They have retained their Christian religion and speak mainly English. Their numbers are declining as they are emigrating to Australia, chiefly because they are concerned at the insistence upon Sinhalese as the only official language and fear that they will lose their identity.

Ceylon was once part of the Indian mainland from which it is separated by Palk Strait. The coral Adam's Bridge forms a chain of island links. The reef is covered by only a few feet of water at high tide, but three channels have been cut through it for the use of coastal traffic. Ocean-going vessels are forced to skirt the east coast of Ceylon. It derives its name from the Sinhalese legend that the world was populated by Man spreading to the Indian mainland and thence to the other lands by using the islands as "stepping-stones." As a matter of fact, the island was probably populated by several waves of people moving in the opposite direction. The two largest islands—Mannar, off Ceylon, and Rameswaram, off the east coast of India—are crossed by railways which make the sea-crossing a very short one.

The outstanding relief feature is the high plateau which occupies the greater part of the wider southern half of the island. It is formed by a mass of ancient crystalline rock similar to that of Southern India with which it was once continuous. Swift streams have eroded deep valleys which run in a general north-east to south-west direction. In some parts there are large flat areas hemmed in by mountains. Many of the latter rise to over 7,000 ft., including Mount Pedrotallagalla (8,326 ft.) and Adam's Peak (7,360 ft.). Rivers radiate in all directions from the highlands and at fairly even intervals, but they are of no great importance.

Surrounding the plateau to the west, south, and east there is a relatively narrow coastal plain which is undulating in character. It is composed of laterite, a red rock which forms a fertile soil. Breaking through the laterite there are upthrusts

of more resistant crystalline rock which form isolated hills. The northern portion consists of a limestone lowland which is less than 300 ft. above sea-level. It is the least developed and most sparsely populated part of the island.

Climatically Ceylon is grouped with the Equatorial lowlands although much of it is highland where the average temperatures fall below 18° C. (64° F.) in winter. In the north-eastern area there is a winter maximum of rainfall

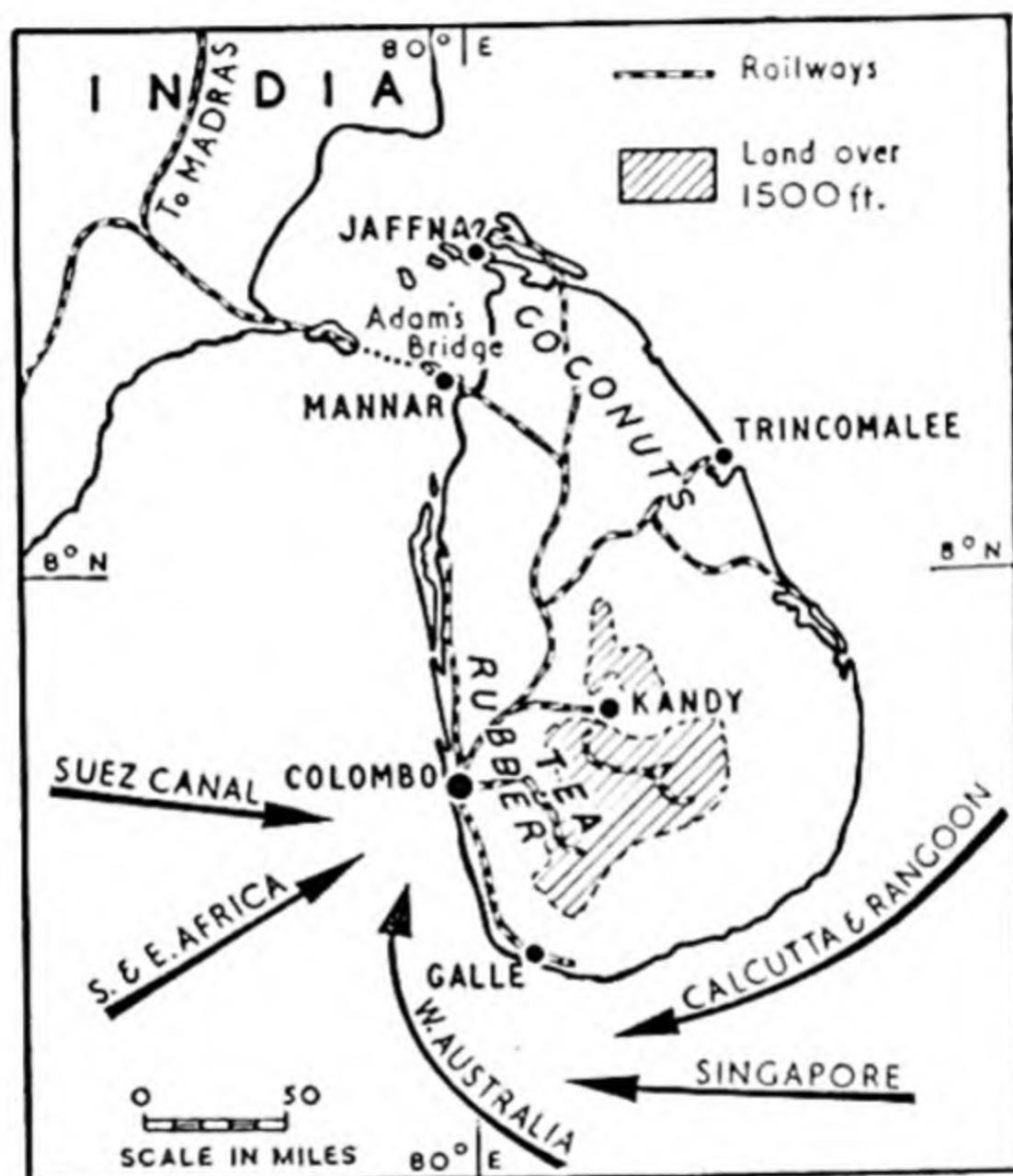


Fig. 32. CEYLON.

derived from the north-east monsoon. Owing to its relief, the least rainfall is recorded in the north-west, where it averages 40 in. Conversely, the highest average is in the mountainous part of the south-west, where it often exceeds 200 in. The south-eastern coastal plain has a relatively low rainfall. On the plateau itself there is a great deal of mist which often persists for some weeks. At the Equinoxes there are lighter rains, caused partly by low pressure systems and partly by convectional thunderstorms.

Colombo (see Table, p. 24) has an abnormally low average diurnal temperature range of 5 C. $^{\circ}$ (9 F. $^{\circ}$). In the summer months it is only 2 C. $^{\circ}$ (4 F. $^{\circ}$) owing to the modifying effect of the south-west sea winds upon the day temperatures.

The natural vegetation varies greatly with changes in relief, drainage, soil, rainfall, and temperature. There are dense jungles in the south, forests on the drier slopes of the north-centre, patunas, or grasslands, on undulating ground between 1,500 and 2,000 ft. (tropical savana) and again between 6,000 and 8,000 ft. (temperate grass). In the extreme north there is poor scrubland where the soil is light and the rainfall low.

Only one-fifth of the total area is cultivated. On this the main crops are tea, rubber, and coconuts, which together provide 95 per cent. of Ceylon's exports and two-thirds of the employment. The second greatest agricultural area is devoted to coconut palms, which provide valuable exports of copra, dessicated coconut, coconut oil, and coir (coconut matting). They are grown in the foothills and more especially all round the coast, particularly near Colombo. Ceylon has the reputation of growing the best coconuts in the world.

The greatest acreage is under rice, which is the chief food product. Production is about 1 million tons, only two-thirds of Ceylon's consumption and the balance is imported mainly from China. The rice is, of course, grown mainly on the coastal lowlands, especially in the south-west. There was, at one time, a considerable production in the north-east where the fields were irrigated from "tanks" (primitive reservoirs), but those fell into disrepair and only recently has any effort been made to bring them back into use. One reason for this was the prevalence of malaria in the northern "dry" area because, with a small seasonal rainfall the streams shrink and provide breeding grounds for the anopheles mosquito, whereas in the "wet" areas the stream régimes are constant so that only occasional epidemics occur. This resulted in a concentration of population in the latter. Great efforts have been made to restore the irrigation systems and to combat malaria, and a steady stream of colonists has been moving in. Even the plateau edge has been terraced for rice, so urgent is the need. As a result of these developments, and especially of the Gal Oya (River) irrigation project,

250,000 acres of new land will be brought under cultivation, including over 100,000 acres of rice.

Rubber, which was first introduced in 1876, is mainly produced in the wet south-western coastal lowlands and foothills. It provides about 7 per cent. of the world's total output. In 1970 the total yield was 175,000 tons (707 lb. per acre). The chief buyer is China. As in Malaya, much work has been done in replanting and improving the yield per tree. Tea is the most valuable product and provides about 65 per cent. of the island's exports (470 million lb.). Most of the plantations are on the south-west of the plateau, especially near Kandy. It is also grown in the foothill country. So great is the demand for labour for the picking that many thousands of Tamil workers were brought over from south-eastern India. The larger companies make elaborate arrangements for their accommodation and welfare. Incidentally, most of the workers on the rubber estates are also Tamils. One advantage is that owing to the non-seasonal nature of the climate tea-picking can be carried on throughout the year.

Cinnamon was originally the chief commercial product, but there is not such a great demand in these days. It is grown in coastal areas where the soil is light and sandy. Other products are areca nuts, cinchona, citronella, cacao, kapok, cardamoms, and papaya. There are 2,500,000 cattle, mainly used as draught oxen, and there are nearly 600,000 goats.

AGRICULTURE OF CEYLON

Rice ..	..	..	..	..	1,900,000 acres
Coconuts ..	..	..	..	..	1,150,000
Rubber ..	..	..	..	..	600,000
Tea ..	..	..	..	..	600,000
Cinnamon and Citronella ..	..	..	..	..	28,000
Cacao ..	..	..	..	..	26,000
Tobacco ..	..	..	..	..	22,000

The chief mineral wealth is plumbago (graphite) which is used mostly in the manufacture of lead pencils and black lead. Rubies and sapphires are found on the south-western mountain slopes in alluvial deposits and are quarried. Pearl-diving is carried on by Tamil divers near Mannar. Timber is a valuable asset, especially teak, over 4,000 tons being exported annually. Ply-wood and tea-chests are made, and ceiling and floor boards are exported.

There has been a certain amount of industrial development in recent years, e.g. there are cotton weaving mills at Moratuwa and Jaffna, using cotton imported from India, and there are soap works, coconut matting factories, rolling mills, tile and cement works, tobacco factories, leather works, pulp mills, tyre factory, and chemical industries.

Colombo (551,200), the chief port and modern capital, is situated on the south-west coast. It is an extremely important focal point of Indian Ocean trade routes owing to its position near the southern end of the Indian peninsula which divides the Bay of Bengal and Arabian Sea. It is linked with the Red Sea, Bombay, Calcutta, Rangoon, Singapore, East and South Africa, and Fremantle. It handles nearly the whole of the trade of Ceylon and is an important refuelling centre. From it 950 miles of railways radiate, northwards to Jaffna with a branch to Mannar Island, southwards to Matana, and eastwards on to the plateau to Kandy, the old capital, and to the hill-station of Nuwara Eliya (Neuralia). There are also about 5,000 miles of metalled roads as well as about 120 miles of canals along the south-west coast, built by the Dutch. The harbour is an artificial one, the largest in the world.

Trincomalee (17,000), on the east coast, has one of the finest natural harbours in the world. A British naval base until 1958, it has been developed by the Republic for commercial purposes to relieve the pressure on Colombo.

The chief exports are—tea (£86 million), rubber (£20 million), copra (£5 million), coconut oil (£8 million). The chief imports are rice, cotton goods, coal (from S. Africa), sugar, and fertilisers.

The Maldives are a group of 12 coral atolls about 400 miles to the south-west of Ceylon and were a dependency of the Dominion. After a short period as a Republic, the 800-year-old Sultanate was restored in 1954. They have a population of 93,000, chiefly Muhammadans. They are great sailors and traders, exporting fish to Ceylon. The islands produce coconuts and millet. Male (8,000) is the capital.

CHAPTER XI

THE BURMA UNION

Burma consists of a series of north-south fold ranges separated from each other by parallel valleys. The Arakan Yoma runs quite close to the west coast. It exceeds 10,000 ft. in the north, but dies away to 1000 ft. in the south. It is bordered in the east by the Chindwin—Lower Irrawaddy Valley. Then follows a much lower and more broken range, the Pegu Yoma. We have seen how the Irrawaddy has made one big break in the Mandalay area. The next valley is that of the Upper Irrawaddy and the beheaded Sittang. The extreme east is composed of the Shan (mountain) States where there is a succession of ridges and valleys, the outstanding feature being the Salween Valley. The south-west of Burma consists of the vast delta of the Irrawaddy, which is continued by the Sittang estuary lands and the Salween Delta. Extending far to the south-east on to the base of the Malay Peninsula, which is shared with Siam, is the Tenasserim Province, a narrow coastal area backed by the Bilankiang Range.

The climate is much affected by the relief which is at an angle to the prevailing winds at both seasons. Although the rainfall occurs mainly in summer, the Chindwin Valley and that of the Middle Irrawaddy have an average much below that of the remainder of the country because they are in the "rain-shadow" of the Arakan Yoma in the highest part. Members of the 14th Army during the campaign of 1944 were amazed to find themselves in a semi-desert in north-west Burma, a complete contrast to the steamy jungles of the north-east of India. Some indication of the difference is seen on comparing the rainfall of Rangoon (99 in.) with that of Mandalay (35 in.). On the exposed Arakan and Tenasserim coasts the rainfall varies from 200 to 250 in.

Much of Burma is densely forested, especially on the windward sides of the mountain ranges. The forests yield valuable supplies of teak, mainly used in ship construction and also in the benches of chemical laboratories, as it is acid resisting. Before the Second World War the exports of teak averaged 450,000 tons a year, but most of the 32,000 square miles of

forest are in areas affected by rebellion so that the export is now appreciably reduced. Much of the hauling and stacking of logs is done by elephants. The logs are formed into rafts and floated downstream to Rangoon.

By far the most important crop is rice, which is mainly grown in the wetter areas of the north and south, although there are many thousands of acres of irrigated land in the centre. One of the

finest rice-growing areas is the Akyab district, a narrow coastal strip to the west of the Arakan Yoma. This is watered by many rivers whose deltas combine to provide extensive belts of very fertile soil. In all, there are some 12 million acres under rice, and the yield is half a ton to the acre. Burma normally exports over half its rice and is easily the leading exporter in the world. In 1966 the export was 900,000 tons, 35 per cent. of the figure 25 years ago. Much of it goes to India. Normally, Britain also buys most of its rice from Burma. There are large acre-

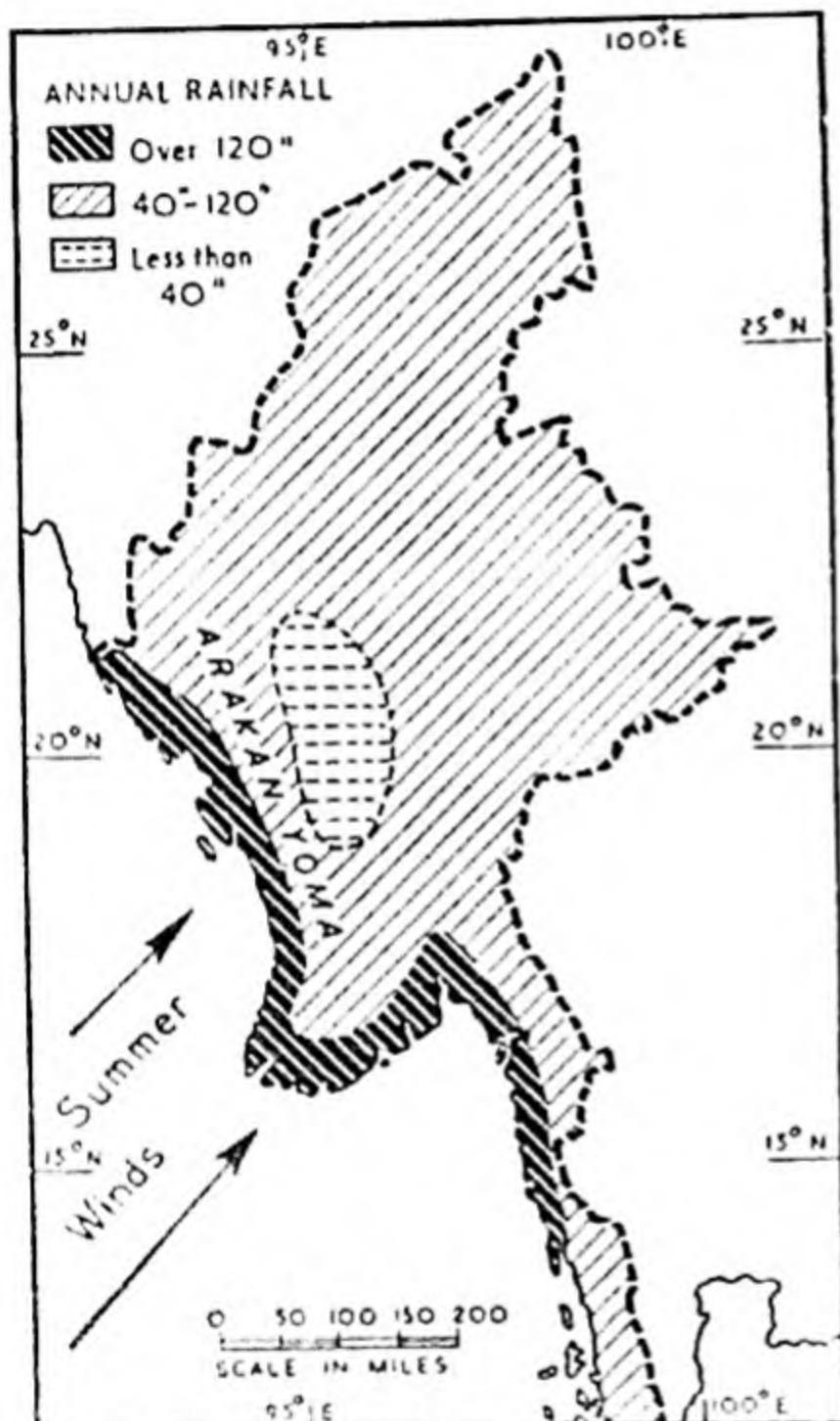


Fig. 33. BURMA—ANNUAL RAINFALL.

ages under oil seeds (sesamum and ground-nuts), cotton, maize, and tobacco. A small quantity of rubber is produced in Lower Burma. Millets, ground-nuts, and cotton are grown in the drier parts.

Burma is rich in minerals, oil being the most important. About 500,000 tons are produced annually in the fields near Monywa in Central Burma, and at Chauk in the Lower Irrawaddy Basin. The latter is now the main producer because

it is in Government-controlled territory. A new refinery has been built there. Tin is mined in the Tenasserim district of the south-east, especially in the Tavoy Valley. Lead, silver, copper, and zinc are mined at Bawdwin in the northern Shan States. Mawchi, in the Karen country of the Middle Salween Valley, mines tungsten and tin. Burma is rich in precious and semi-precious stones, especially round Mogok, east of the Upper Irrawaddy, which yields rubies and sapphires. Jade, which has long been mined in the north-east, is exported mainly to China. Other minerals are salt, antimony, nickel, and gold. There are very few manufactures, matches being amongst the most important. There are cement mills on the Lower Irrawaddy at Thayetmyo.

Much of the communications are carried on by water, for the Irrawaddy is navigable to Bhamo (900 miles) and the Chindwin for 300 miles from the confluence. The chief railway runs from Rangoon up the Sittang Valley to Mandalay, an important junction for lines to the north-west (oil-fields), north to Myitkyina, and north-east to Lashio, from which the "Burma Road" opened up a new route to China during the Second World War. Now the Burmese section is hardly used and is rapidly falling into a state of disrepair.

Rangoon, the capital, has a population of $1\frac{1}{2}$ million. It is situated on the easternmost branch of the Irrawaddy Delta some 25 miles from the mouth. It is so placed that it receives the trade of both main valleys and thus exports the bulk of Burmese surplus products. This trade is mainly with India, and is carried on by sea owing to the barrier of the Arakan Yoma. Akyab (37,000) is the chief port of the west coast. It is situated on the east of an island just off the mouth of the Kalandan River. Moulmein, at the mouth of the Salween River, handles the trade of the eastern valleys and also some of Thailand's teak exports.

With an area of 260,000 square miles, Burma has a population of 24 million, 16 million of whom are native Burmese of Mongolian origin, and nearly all Buddhists. There are $1\frac{1}{2}$ million Karens, originally hill men of the south-east but now living chiefly in the south-eastern plains. The 1,200,000 Shans live in the Shan States and the 1 million Indians who have immigrated have mostly settled in the cities, where much

of the trade is in their hands. They are not liked by the Burmese who resent their influence upon affairs.

In January 1948, Burma severed its connection with the British Empire and became an independent republic formed by a union of three states—the Shan State of the north-east, the Kachin State of the centre, and the Karen State of the south-east. The new Burma has several serious problems to face, *e.g.* how to restore quickly the economy of the country whose chief industries—rice growing, oil mining, and tin-dredging—had been so badly interfered with during the 1944-5 campaigns. This work has been seriously handicapped by the raiding tactics of Chinese Communists in the north, Chinese Nationalists in the centre, and Karen rebels in the south-east. But now that boundary disputes with China have been settled, the Nationalists have been evacuated to Taiwan, and peace has been made with the Karens, the country is much quieter. Finally, there is the question: How can the various ethnological elements be welded together politically as Burmese whilst still retaining their essential social and cultural differences?

CHAPTER XII

MALAYSIA; SINGAPORE; BRUNEI

After liberation from the Japanese the Federated and Non-Federated Malay States and the Straits Settlements were amalgamated to form the Federation of Malaya, a self-governing member of the British Commonwealth. In 1963 the Federation was extended to include Singapore (which withdrew in 1965), Sarawak, and Sabah (the former British North Borneo). The Federation occupies the southern and widest part of the Malay Peninsula, being bordered to the north by Thailand. It is separated from Sumatra by the Strait of Malacca, which is only about 40 miles wide.

〔The Malay Peninsula and the East Indian Archipelago form a geographical unit. Structurally, they are part of the great system of fold ranges which girdles the world from North Africa and Spain to New Zealand. They are the remains of a partly submerged land mass, and have a high proportion of mountainous area. If you study the relief map you can trace the way in which the outline of the peninsula and the lines of the islands have been created by fold ranges and how shapes, sometimes grotesque, have been influenced by the radiation of ranges from central knots, *e.g.* the "spine" of Malaya is continued through the Lingga Archipelago, Banka, and Biliton, and then swings north-eastwards to form the Schwaner Mountains of Borneo. In Malaya the mountains rise in the centre to nearly 7,200 ft. (Mt. Tahan). To the south they fall away again and there are isolated uplands standing out from an undulating lowland. Owing to the long and narrow character of the peninsula few important rivers develop, but there are numerous short ones. The two principal streams are the Perak and the Pahang.〕

WEST MALAYSIA

Climate

Climatically, the peninsula may be classed as an Equatorial Lowland, although there are many modifications due partly to relief and partly to the monsoonal reversal of the winds. Pressure remains low and remarkably even throughout the

year, e.g. in Singapore it varies only from 29.8 to 29.88 in. Sea-level temperatures are very equable; the annual range is only 2 C. $^{\circ}$ (4 F. $^{\circ}$) at Singapore. The diurnal range usually amounts to about 7 C. $^{\circ}$ (12 F. $^{\circ}$). There are south-west winds in summer and north-east in winter over the greater part of the area. The mean annual rainfall is often higher than the average for the type of climate because, owing to the peninsular character, both winds are rain-bearing. Monsoonal influences are also seen in the "seasonal distribution" of rain. Most places on the east coast have their heaviest rainfall in the winter, because in the summer the south-westerlies strike the mountain rim before reaching the lowlands. Much of the southern part of Malaya may be said to be in the rain-shadow of the Sumatran Mountains. At the equinoxes, strong winds known as "Sumatras" blow from the south.

Natural Vegetation

Four-fifths of the land is covered with dense jungle, only the western coastlands, the extreme north, and belts along the main rivers having been cleared for cultivation. There is a great variety of species of plant life, 9,000 types having been counted, including 3,000 varieties of trees. On the lowlands the highest trees reach 150-200 ft.; beneath these there are others of about 100 ft., then smaller trees, and finally palms, ferns, and ginger plants. The whole is bound together by giant creepers. There are mangrove swamps along the Strait of Malacca, but on the eastern coast, where the rainfall is lighter, the forest is not so dense. Just inside this forest belt there are swamp lands. Indeed, swamps occupy one-tenth of Malaya. The only open spaces are in the interior where great grasses grow. They occur in former clearings where such crops as tapioca, mountain rice, and pineapples were grown until the soil became exhausted through over-cultivation.

Economic Geography

Malaya and Indonesia between them produce the greater part of the world's tin and rubber. The latter is by far the most important commercial vegetable product. It is the latex of the tree, *Hevea brasiliensis*, a native of the Amazon selvas. In

Malaya the giant grasses were a great nuisance to the rubber planters because the roots tended to choke the young trees: damage was also done by fire. At first great efforts were made to keep the land clear by weeding, but it was found that this destroyed the natural "humus" and impoverished the soil, so now the scrub is allowed to grow except immediately around the trees. Most of the plantations are owned by companies, employing mainly Chinese workers who have been in a very

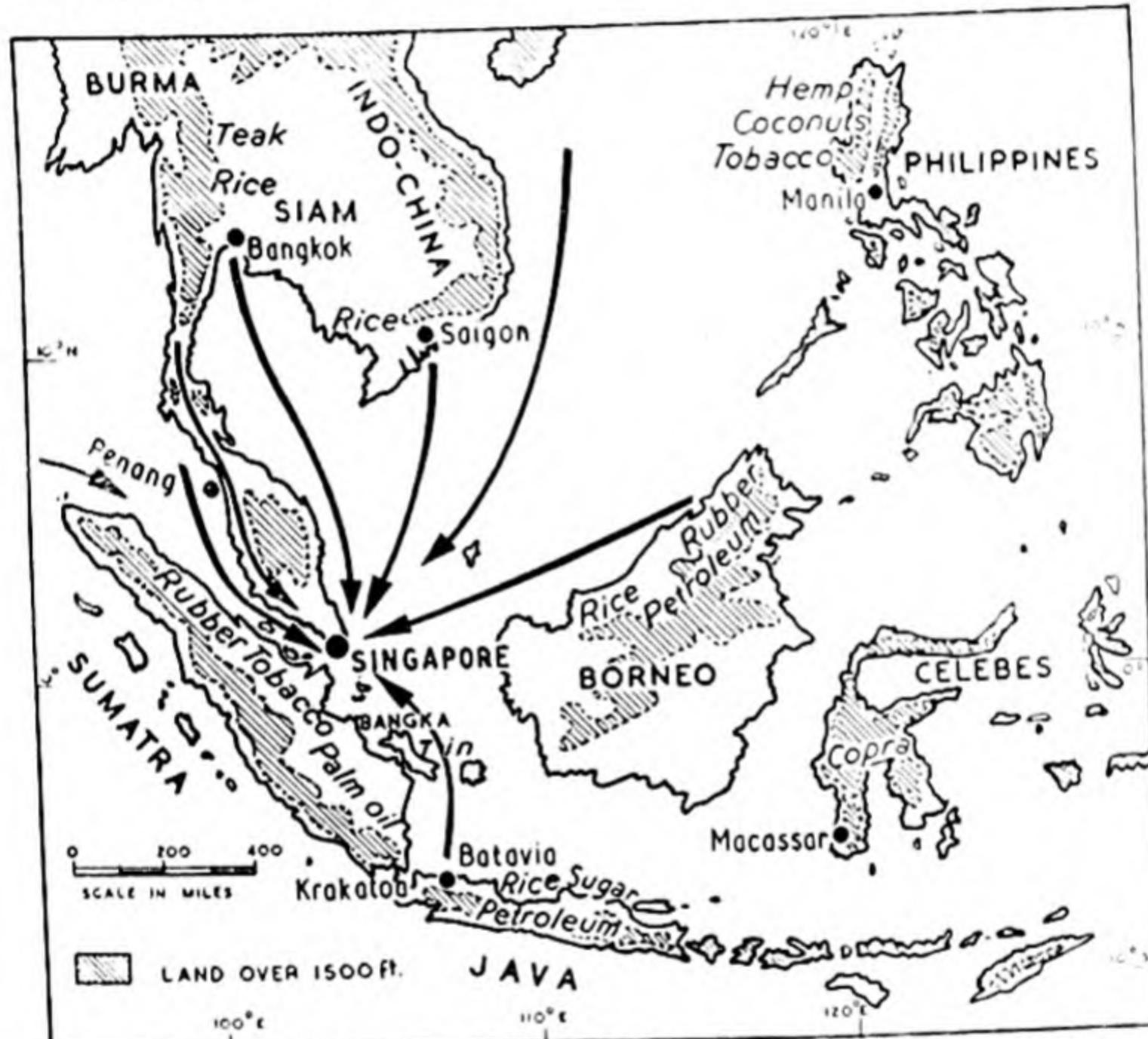


Fig. 34. ECONOMIC GEOGRAPHY OF THE EAST INDIES AND MALAYA.
Note the importance of Singapore as an entrepôt.

unsettled state owing to the success of Communism in their own country. The Chinaman overseas is very liable to follow the lead of his countrymen at home and many of the younger men took to the jungle as guerillas. This seriously slowed up the recovery from the wartime occupation by the Japanese, when very considerable plantation areas were destroyed. New large tracts have been declared free of Communism, and the rubber industry, in common with others, should develop.

Great replanting schemes were carried out. With America producing nearly 2 million tons of synthetic rubber a year there are now signs of over-production. However, a promising new market should develop with the lifting of trade restrictions against China, and the U.S.S.R. has become a large importer. Exports of Malayan-produced rubber amount to over 1,300,000 tons a year (see Singapore).

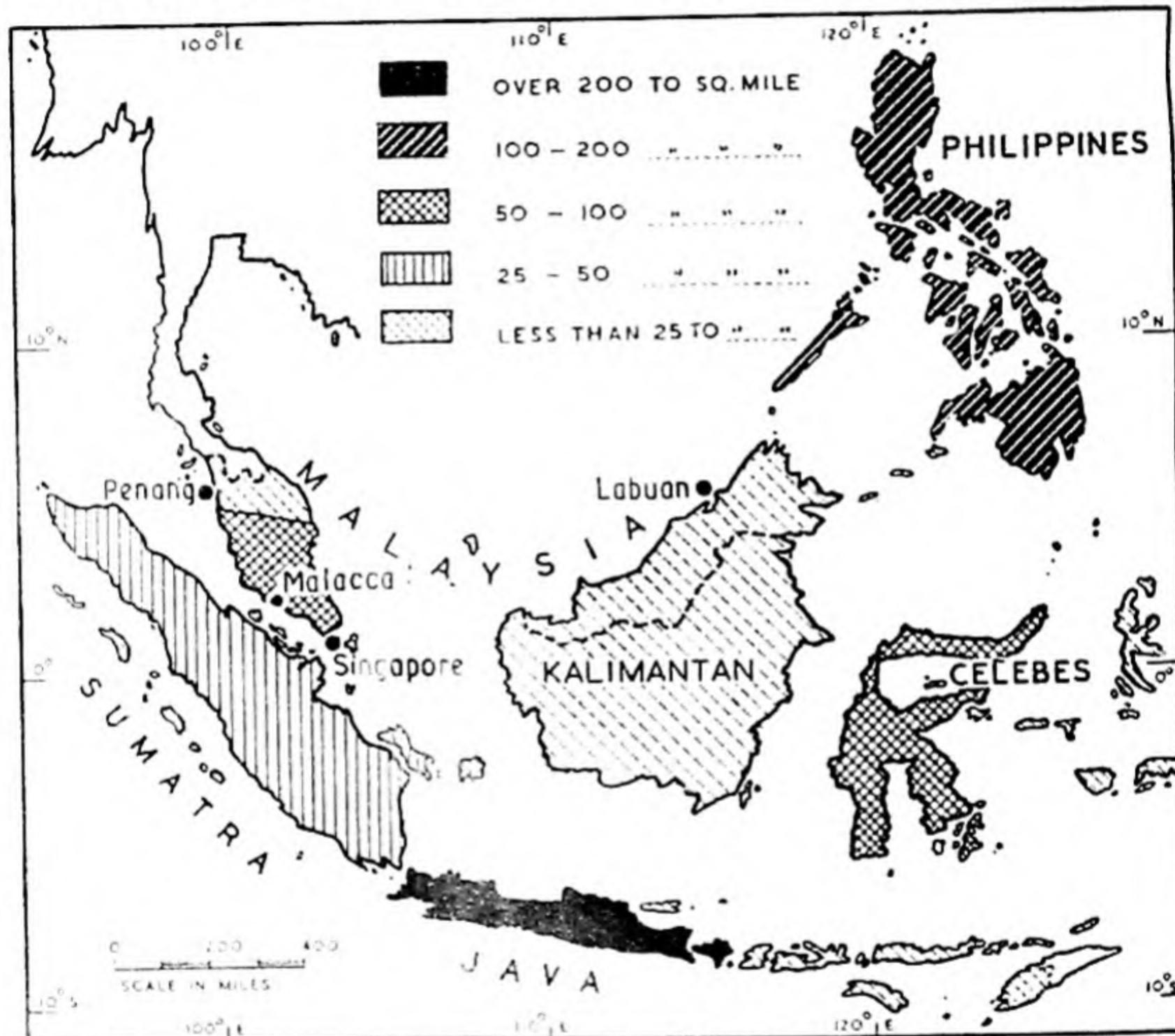


Fig. 35. EAST INDIES AND MALAYA—DENSITY OF POPULATION.

Rice is the chief food crop and is nearly all "wet" rice grown in paddy fields on the western coastal plain. There are over 1,000,000 acres under rice and the yield is about 1 million tons. Malaya has to import about one-third of its rice requirements, but new schemes of irrigation are in hand, *e.g.* in Northern Trengganu on the north-east coast where 27,000 acres have been brought into cultivation.

Coconut palms are also widely grown. They are chiefly concentrated in the north-western and south-western coastal districts, most of them on Malay-owned holdings. Conditions are so ideal that only about 4,000 nuts are needed to produce one ton of copra as compared with 6,000-8,000 in most other areas. There are about half a million acres of coconut palms, and 18,000 tons of copra are exported, together with 2,000 tons of oil which is extracted by hydraulic presses.

Pineapples are grown in the extreme south in Johore and Selangor on sandy soil. There are 255,000 acres yielding about one ton an acre. Oil palms are increasingly important, being cultivated now by so many rubber companies. There are over 640,000 acres with a production of over 320,000 tons.

Other food crops are tapioca, sweet potatoes, sago, bananas, coffee, sugarcane, ground-nuts, maize, yams, soya beans, pulses, and vegetables, and other export crops are spices, especially pepper and tea. In addition, smaller quantities of cocoa, hemp, kapok, coffee, cinchona, gutta-percha, tobacco, and sugar palm are grown. Lesser known and interesting plant products are: derris, the root of a climbing plant which when powdered is used as an insecticide and for fish poison; ramie, which is the fibre of a stingless nettle, used in the making of bank-notes and gas mantles; gambier used in tanning and dyes; ipecacuanha, a root providing a medicine for bronchial complaints; patchouli, whose dried branches yield perfume; citronella, which is a grass containing oil used in perfume and as an insect repellent; and tung oil obtained from nut kernels and used in quick drying varnishes and paints. Betel nuts, from the areca palms, are very popular in the East for chewing, the red juice staining mouth and lips.

Many of the forests are protected to prevent erosion, but the remainder yield 40 million cu. ft. a year of hardwoods, of which about 2 million cu. ft. are exported.

The outstanding mineral is tin, but production is declining (1970, 73,000 tons). Much of the tin is gained by alluvial mining, *i.e.* by dredging the deposits in the lower reaches of rivers or further up-stream where inland deltas have been formed as streams leave the mountainous "spine". It is particularly important along the Kinta and Klang Rivers which flow out on to the mid-western coast. Actual mining of tin-lode is carried on in Pahang, one of the east coast States.

Chinese again provide most of the labour, including a large number of women engaged in "panning", *i.e.* shaking the dredged material in shallow wooden dishes so that the heavy tin remains and the lighter rubbish is thrown away. This primitive and wasteful method is still in use in the many Chinese-owned workings.

Malaya obtains over 5 million tons of iron ore from mines in Trengganu at Bukit Besi; Johore at Srimedan; Kelantan at Kota Bahru etc., and from open cast workings at Rompin in Pahang. This provides Japan with the bulk of its iron ore imports. Coal, with an output of three-quarters of a million tons, is mined at Batu Arang in Selangor, most of it being sent to Singapore for the tin smelters.

Other minerals are gold, mined in Pahang (2,000 ozs.); bauxite from Pengarang in South-East Johore (750,000 tons); and tungsten.

There are few industries other than those connected with food preparation, *e.g.* rice milling.

A satellite town named

Petaling Jaya has been built near Kuala Lumpur. It has many light industries as well as an aluminium rolling mill. There is an oil refinery at Port Dickson and hydro-electric power is being developed in the Cameron Highlands.

Communications are relatively good. There are over 1,300 miles of railway, the main line linking Singapore via Kuala Lumpur with Penang. Branches link up with the Thai State Railway and with various ports on the west coast, as well as with Khota Bahru in the north-east.

The capital of the Federation is Kuala Lumpur (400,000), situated in the western foothills about midway along the western and more developed side of the country. Its port is Port

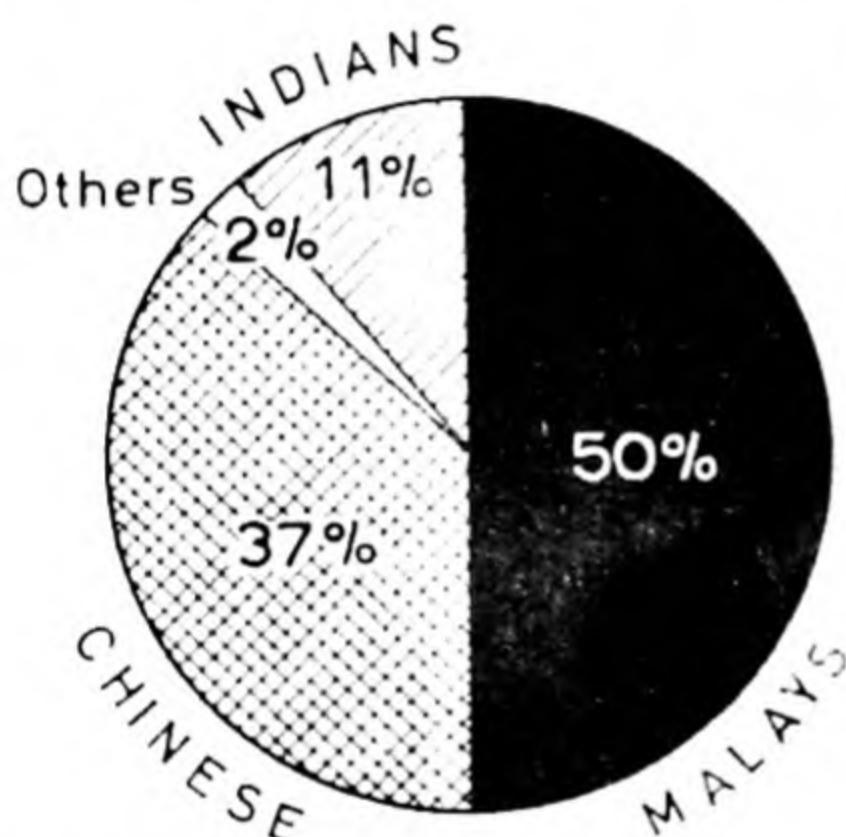
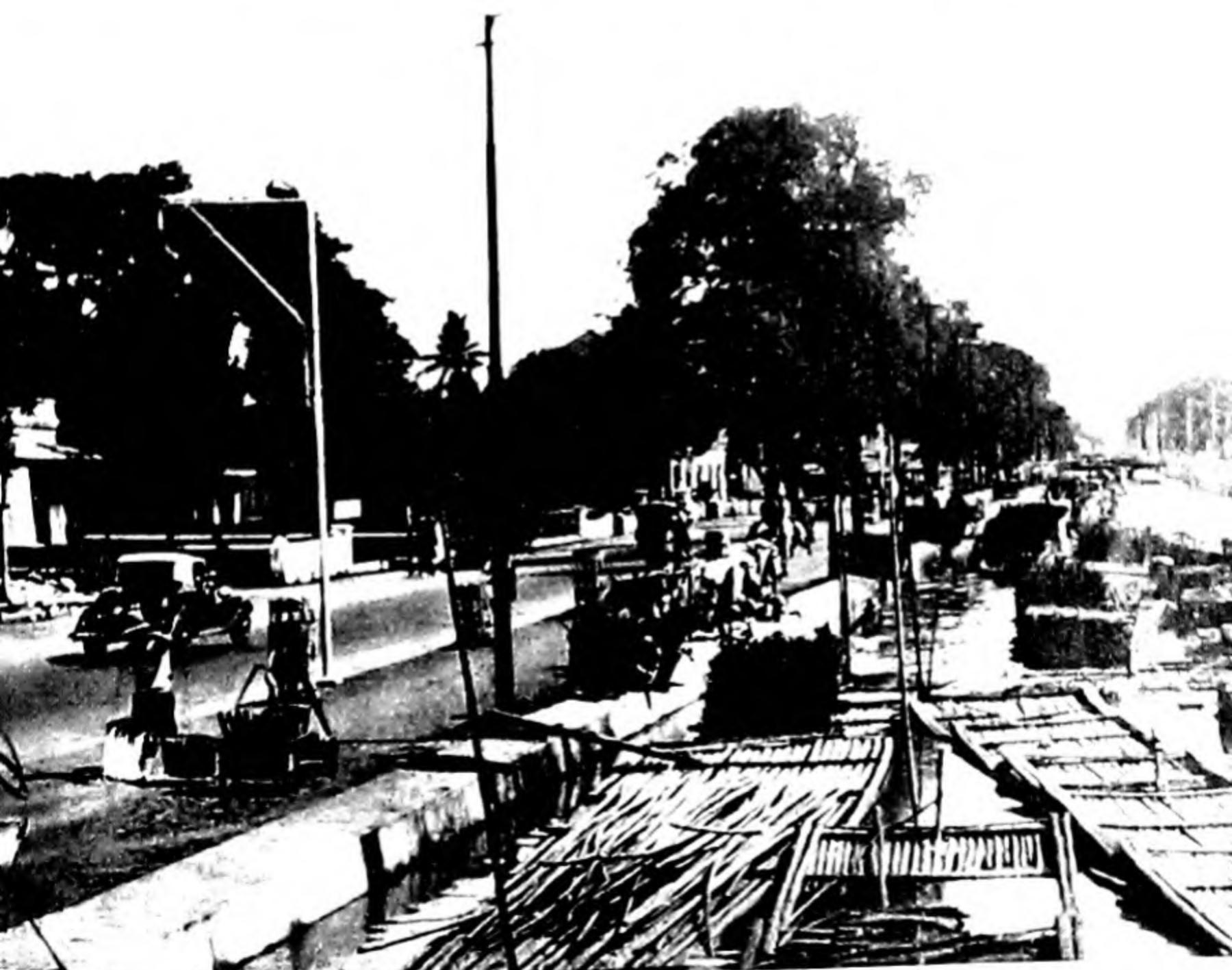


Fig. 136. RACIAL COMPONENTS OF POPULATION OF MALAYA.





Above: Siam. — TERRACED RICE FIELDS. (Exclusive News Agency.)

Below: SURAWANEE. A SIAMESE VILLAGE. (Exclusive News Agency.)

Swettenham. The chief port is Penang, one of the original Straits Settlements, built, like so many trading depots, on an island. It has an important coastal trade with Singapore and a large tin-smelting works. Other ports are Malacca, Teluk Anson, Port Dickson, and Dungun.

Population

The population of Malaya is increasing rapidly. There are over 9,400,000 people, an increase of over 3 million in 18 years. The following shows the proportion by races: Malays, 4,200,000; Chinese, 3,070,000; Indians, 932,000; Europeans, 17,000; Others, 120,000. The annual increase is 3 per cent.

When we sub-divide the population of Malaya we find that the native Malays are hardly more numerous than the Chinese and Indian immigrants, who were introduced chiefly for work in the rubber and tin industries. They now have a large share of the business of Malaya in their hands. This particularly applies to the Chinese, several of whom were, prior to 1942, the year of the Japanese invasion, numbered amongst the richest subjects of the British Empire. There are also a few thousand aborigines, who live in the less accessible mountain areas and who contribute little to the economic wealth of the country. They are called the Sakias; they are self-supporting, getting a living by very primitive cultivation, keeping a few scavenging pigs and poultry, and collecting wild produce from the forest. Many are now employed in a lumbering industry, felling the hardwood trees of the mountain rain-forests.

Now that the country has gained its independence, one of its chief problems will be the integration of its mixed population, so that they will think of themselves as citizens of the Federation and not as exiles from their respective home countries.

MALAYSIAN BORNEO

Malaysian Borneo consists of the north-western and northern areas of Borneo, its boundary with Indonesian Borneo, now named Kalimantan, roughly coinciding with the watershed formed by the Iran Mountains. Numerous rivers drain from

this watershed, but the only well-developed system is that of the Rajang and its tributary the Mujong, which enters the sea in the west of Sarawak by a large delta.

SARAWAK

This is the larger sub-division, with an area of 48,000 square miles. It may be divided into three relief regions: (1) the coastal plain which is swampy and alluvial in parts, but with mountainous outcrops; (2) an intermediate belt of undulating clay lands broken by ranges rising to (3) the mountainous border country.

The climate is somewhat different from that of the other islands dealt with in this chapter, for it has its rainfall in the winter months from the north-east which makes it more comparable with that of Eastern Ceylon. Like Eastern Ceylon, it is in the rain shadow in relation to the summer south-west winds. The rainfall varies from 100 in. at sea-level to 200 in. in the interior. The air is hot and humid, temperature varying from 70°-90°.

Nearly three-quarters of the area is forest with equatorial lowland density and variety of species (2,500). Raimina (light hardwood for furniture) and ironwood are exported. There are 13,000 square miles of cultivated land. Rice is the staple food. Wet paddy is grown in the lowlands, particularly on the Rajang delta (350,000 acres), but by primitive methods, so that the yield is low. Rubber is the chief export crop, mostly produced on small-holdings of under 100 acres, the annual production being 50,000 tons. There are about 75,000 acres of sago palm under development, but here again the methods are inefficient and the yield low. Sago is obtained by felling the palms and splitting them, the inner pith being then scraped out. The pepper-vine is grown widely in small-holdings by Chinese. There are about 21,000 acres under coconuts.

In the extreme north-east corner there is a small oil-field at Miri, with a refinery at Lutong where oil is also brought from Seria in Brunei. Chinese are mining gold in the interior, and coal-mines are being developed by the Japanese. Bauxite is the chief mineral, 250,000 tons being exported.

The capital is Kuching (50,000), some 18 miles up the Sarawak River in the extreme south-west. Sibu (30,000) is the centre of the Rajang Valley and Miri (13,000), of the oil-field.

The total population is 950,000. There are 240,000 Sea Dayaks, *i.e.* coast dwellers, 57,000 Land Dayaks, 230,000 Chinese, 130,000 Malays, and 1,500 Europeans.

SABAH

Sabah has an area of 29,545 square miles, and includes the island of Labuan, 6 miles off-shore. The relief consists of a series of alternating fold ranges and valleys at right-angles to the north-east coast (transverse coastline), which results in many indentations. The principal river is the Pegalan, which drains the Keningun and Tambunan Plains. The coastal area has much swampland. The highest point is Mount Kinabalu.

The development of Sabah is hindered by lack of labour—the population is only 520,000—and capital. There is now a steady flow of immigrants from Timor and Celebes.

The chief crops are rubber (acres, 260,000; production, 29,000 tons); rice (wet, 82,000 acres; dry, 29,000; production, 55,000 tons); coconuts (46,000 acres); oil palms, hemp, tobacco, and jute. The forests yield valuable timber, some 172 million cubic feet being exported, the Japanese being the best customers.

The population includes Dusun (farmers), 150,000; Bajav (fishermen), 45,000; Murut (hillmen), 26,000; and Chinese, 105,000. The capital Kinta Kinabalu (Jesselton) (42,000), is on the narrow western coastal plain. The chief port is Labuan on Labuan Island in Brunei Bay in the extreme south-west, Victoria Harbour giving a fine sheltered anchorage. It handles most of the trade of North Borneo and Brunei amounting to a shipping tonnage of over 11 million annually. Sandakan (39,500) handles the trade of the north coast.

SINGAPORE

Singapore is situated on Singapore Island, just off the southern tip of the Peninsula, and is joined to the mainland by a causeway. It is in a commanding position on the Malacca Strait, through which nearly all shipping between the Indian and Pacific Oceans passes. It was because of this strategic position that it was converted into a powerful naval and air base. The Royal Naval Dockyard was the largest single employer, but this source of employment has ceased with the withdrawal of British Forces. Great efforts are being

made to substitute other industries. The Jurong Industrial Estate covers over 18,000 acres of reclaimed jungle and swamp in the south-west corner of the island. By 1970 some 420 industries had already been established, including a shipyard, iron and steel works, chemical plants, tyre works and a cycle factory. With a density of population of 9,000 per square mile there is not much room for agriculture, but the island produces 35,000 tons of vegetables and 250 million eggs. Fishing is increasingly important.

Like Colombo, Singapore acts as a focal point of routes, but it is even more important as an entrepôt. It handles the greatest part of the trade of Malaya, coastal vessels bringing rubber, tin, and other commodities down both coasts as well as from all parts of the East Indies, to be transhipped to ocean steamers. A new dock has been opened to deal with container ships. Apart from its position as commercial capital of South-East Asia, it is the largest tin-smelting centre in the world, handling tin from Burma and Siam, as well as from Malaya. In addition to the industries at Jurong, there are also large pineapple canneries, timber processing works, and a considerable number of light industries, *e.g.* transistor radios, soap, paint, boot polish, leather and rubber shoes, and ropes.

The population is 2,000,000, of whom 1,450,000 are Chinese. Seventeen years ago it was 1,000,000. The birth-rate is 29 per 1,000, and one of the chief problems facing the State is that over half the population is under 21 years of age.

THE SULTANATE OF BRUNEI

Brunei was the smallest part of British Borneo, but the richest owing to the development of its oil resources. It has an area of 2,226 square miles. Its agricultural products are very similar to those of Sarawak, and there is a small export of hardwoods. The oil-field is at Seria in the extreme west, and has the distinction of being the largest single producer in the Commonwealth (5 million tons).

The capital is Bandar Seri, which is situated 9 miles up the Brunei River in the extreme north-east. The population is 60,000. Bagasen is the chief port, but, like the others, only receives coastal vessels from Labuan where goods are transhipped from ocean-going vessels. The oil town of Seria has a population of 40,000. The total population is 150,000.

CHAPTER XIII

THE EAST INDIES

The East Indian Archipelago forms one of the major island groups of the world and, as has been stated, was once part of a much greater land mass. In other words, it is mainly continental islands with occasional volcanic and coral islands. In this respect it may be compared with the West Indies.

Politically, it falls into two groups: (1) The Republic of Indonesia, which includes Sumatra, Java, the greater part of Borneo, and a host of other islands; and (2) The Philippines, once an American colony but now an independent republic.

In the previous chapter we drew attention to the way in which the great fold system of Euro-Asia is continued through Malaya and the islands. Note how the Andaman and Nicobar Islands line is continued through Sumatra as the Barisan Mountains, thence through Java and eastwards through Bali, Lombok, Soembawa, Flores, Wetar, and the Damar Islands, with a southwards "festoon" through Timor and the Tanimbar Islands to Aroa and the western part of New Guinea. Celebes Island provides the best example of a curious shape. It is caused by four ranges radiating from the central mountain knot of Latimojong (11,463 ft.). Borneo has been built up by a similar series of ranges radiating from the centre knot of Batu Tiban with intervening valleys drained by the best developed river system in the whole of the area. The chief of these are the Kapoeas draining to the south-east, and the Barito to the south. The Philippines are formed by the convergence of four submarine ridges: (1) from the north-east corner of Borneo via the Palawan Islands; (2) from the most easterly point of Sabah through Jolo and Basilan to the south-western peninsula of Mindanao; (3) from the north-eastern claw of Celebes via the Sangihi Islands to the most southerly point of Mindanao; and (4) from the south-east through Talaud Island. From Northern Luzon a double ridge, of which Batan forms a part, links up with the island of Formosa. The highest point in the Philippines is Mount

Apo on Mindanao (10,000 ft.). Sumatra has the highest proportion of lowland, for the Barisan Mountains keep close to the south-west coast leaving the whole of the north-east as a wide plain. The area is very liable to earthquakes and there are many volcanoes, both active and extinct. In 1883 the dormant volcano of Krakatoa blew its top off with a tremendous explosion, the worst eruption ever known. The sea rushed in and flooded the crater formed to a depth of 1,000 ft. and every living thing was destroyed.

Climate

Climatically, the area is very similar to Malaya, exhibiting the same features of even pressure and equable temperature, e.g. annual range at Jakarta only 1 C.° (2 F.°). Java and Sumatra have a rainfall of over 120 in. over most of their areas. The East Indies have a higher rate of thunderstorms than anywhere else in the world, so far as is known. Java has an average of over 200 in a year. Coastal areas are cloudy, averaging 7/10ths-8/10ths cloud area in the rainy season and 5/10ths in the dry. The Philippines are particularly liable to typhoons, extremely violent storms in which the wind velocity reaches 120 m.p.h. They occur chiefly at the equinoxes.

Natural vegetation varies greatly according to altitude. The lowlands are densely forested, but on the upper parts of the ranges there is more open country with belts of savana.

Economic Geography

INDONESIA. In recent years development has been at a standstill. The Japanese occupation brought the usual amount of destruction, and after the liberation and independence little progress was made because of internal strife. One important factor was the reluctance of foreign companies to invest further in Indonesian plantations and industries, partly because of the political uncertainty and partly because it was difficult to obtain the release of any proportion of the profits. Now, under a more liberal régime, confidence has been greatly restored and interest is being taken in the development of mineral and timber resources.

Rubber is grown on a large scale. Indeed, owing to the great increase in the number of Indonesian-owned plantations, as distinct from Dutch-owned, the output just prior to the war almost equalled that of Malaya. Production in 1965 was

630,000 tons, more than half of it from small-holdings. Almost all of it was exported, either to the U.S.A. or to Singapore for re-export. Malayan production in 1965 was 870,000 tons, about one-third from small-holdings. Java is by far the most important island for rubber, as for most other cultivated products, for it has the advantage of a very rich volcanic soil—there are over 50 volcanoes.

Rice, the chief food crop, is grown extensively on small-holdings, and with a total crop of over 13 million tons the islands are nearly self-supporting. Much of the rice is "dry," i.e. irrigated on terraces cut out of the mountain sides. In Java alone there are over 9 million acres of "dry" rice, compared with 900,000 acres of "wet." On the island of Bali irrigation schemes are drawn up by a committee of villagers, whose instructions are implicitly obeyed. Three crops a year are obtained by communal work. When a man is busy on some other task for the community, his fields are cultivated by his neighbours. Other food crops are maize, cassava or tapioca, soya beans, ground-nuts, and sweet potatoes.

Cane-sugar is an important cash crop as well as being grown for home consumption. Total production is about 1,200,000 tons, of which 250,000 are exported, the main source being Java. Cocoa production is being greatly increased and the output is now well over one million tons of cocoa beans, which are exported mainly to Holland and Japan. Other agricultural export crops are copra, 900,000 tons; palm oil, 150,000 tons; coffee, 100,000 tons; tea, 90,000 tons, about half the crop being exported to Holland and of coarse quality; sago, 34,000 tons; areca or betel nuts, 24,000 tons; and nutmegs and mace to remind us that the European name for the East Indies was once "The Spice Islands". About 20,000 tons of tobacco are exported. In the hot, moist air the leaves are large and are used for rolling cigars in Jakarta. The chief customer is Holland. Java also produces cinchona, from which quinine is obtained. Kapok is a product most of which comes from Indonesia. It is obtained from the ceiba tree, which flourishes in the heat and rain and on the volcanic soils. It is grown chiefly on native plantations, very often as a border for paddy fields, for it casts little shade. The fruit is shaped like a cucumber, but is extremely light, about 15,000 pods yielding 136 lb. of the fibre which encases the seeds. The fibre is 15

times as buoyant as cork and carries 30 times its own weight, so it is much used for lifebelts and rafts. It is also used as a heat-insulator, for surgical dressings, and as a filling for pillows and mattresses. It is prepared in hundreds of small Chinese-owned factories, and 25,000 tons, a tremendous volume, is exported annually from Semarang and Surabaja (Java) and Macassar (Celebes) to U.S.A., Australia, and Holland.

Most of the world's pepper (black and white) comes from Indonesia. It is the product of a vine. When its red berries ripen they turn black and provide the pepper-corns. White pepper is obtained by stripping the fruit of its outer fleshy coat before ripening. Indonesia exports 46,000 tons of pepper annually. The benzoin plants provide Friars Balsam, used as an inhalant, and a food preservative, benzoic acid. The leaves of the cassia tree are dried to become senna pods, the medicine, and the bark of the cinnamon tree is dried to provide flavouring and colouring matter. Agar-agar is obtained from red seaweed collected on the shores, especially of Java, and provides another medicine. The forests yield a variety of products, not only cabinet woods, but also gutta-percha, gum, oil, resin, and bamboo canes. Birds' nests and bêche-de-mer (sea-slugs) are exported to China where they are prized as food.

Indonesia is the fourth largest producer of tin (18,000 tons). Bangka produces two-thirds of the total and smelts some of it, but most is sent to Arnhem in Holland and to U.S.A. Belitong is the next producer and sends its output to Holland. Tin is also mined in Singkip in the Rhiow Archipelago to the east of Sumatra.

Petroleum is a major product of the East Indies, about 27 million tons (2 per cent. of the world total) being obtained from Indonesia as a whole, of which 10 million tons comes from Sumatra, where it is found on the east side of the island at Pakanbara in the north and Palembang in the south. From the latter the oil is sent down to the mouth of the River Musi, which can take tankers up to 80,000 tons. Borneo also yields petroleum, the chief fields being at Tarakan and Balikpapan, where there is also a refinery.

Bauxite, from which aluminium is obtained, is mined in Bintang and Kojang, islands of the Riam Archipelago. 170,000 tons are exported to West Germany and Japan. Nearly one million tons of coal are mined, mainly at Omilin in Central Sumatra, Bukut Asam in Southern Sumatra, and on the River Mahahan in South-East Borneo. Other minerals worked are manganese, asphalt, iodine, and some copper and gold in the Achin district of Northern Sumatra.

Agriculture is by far the most important occupation, but manufactures are increasing, especially the weaving of "batik," in which a curious marbled effect is produced on fabric by the use of hot wax. Ship-building on a small scale is carried on at Surabaja, Semarang, and Tandjung Priok, port of Jakarta, all in Java, and at Amboina, an island off Ceram in the Moluccas, most easterly islands of Indonesia. Glass, rubber, pottery, and desiccated coconut are manufactured.

TOWNS. Djakarta (pop. 4,950,000) is the political and commercial capital (as it was under the name of Batavia in the days of the Dutch East Indies). It is situated in North-West Java, by far the most densely populated and economically developed island, and is reasonably centrally placed, within easy access of Sumatra and Borneo. There are, however, strong movements in favour of decentralisation and local autonomy, which is quite natural in a group of islands. Furthermore, the people of the other islands feel that Government policy tends to follow the interests of the Javanese. Jakarta owes much of its commercial importance to its proximity to the Sunda Strait between Sumatra and Java, the only alternative to the Malacca Strait as a sea-way between the Pacific and Indian Oceans. Other important towns in Java are Surabaja, port for the north-east; Semarang, for the north-centre; Soerakarta, rail and road junction of Central Java, placed in a deep gap in the mountains; and Bandung, a mountain resort to the south of Jakarta. The only comparable town in Sumatra is Palembang, the oil refining centre and port which, owing to the importance of the oil, handles by far the largest tonnage of any Indonesian port (5 million tons, compared with three-quarters of a million tons at Tandjung Priok). Similarly, Balikpapan, in Eastern Borneo, is the second most important port with 2½ million tons because of the local oil production. The only other

towns of any size are Macassar, in the extreme south-west of Celebes, and Amboina, in the Moluccas.

Distribution of Population

Note that, the density is above that of the average for other equatorial lowlands. In the Congo it is 10 to the square mile, in Amazonia (Brazil) it is 16. This is due to the greater facilities for exploitation, the fewer transport difficulties, and

POPULATION TABLE. INDONESIA (1961 Census)

		AREA (sq. miles)	POPULATION	DENSITY (per sq. mi.)
Java and Madura	.. ..	51,032	63,000,000	1,235
Sumatra	.. ..	164,143	15,700,000	96
Celebes	.. ..	72,986	7,000,000	96
Borneo	.. ..	208,285	5,000,000	24
Other islands	.. ..	22,685	6,500,000	295
Total	..	519,131	97,200,000	187

In 1930, the total population was 58 million with an overall density of 108. Java had a population of 42 million and a density of 817. In 1970 the estimated total population was 120 million—average density—225.

a more favourable climate. Java, with its extremely rich soil, has the very high average of 1,235, greater than that of the industrial countries of North-Western Europe or North-Eastern U.S.A., and the agricultural lowlands of the monsoon area. Most of the people are native Indonesians, *i.e.* Javanese and Sundanese in Java; Bataks, Achinese, and Menangkabans in Sumatra; Balinese in Bali; Madurese in Madura; Dayaks in Borneo—all similar to Malays. There are many Chinese and a considerable number of Arabs, although many of the former have been compelled to return to China if they would not accept Indonesian nationality. The standard of civilisation amongst the Indonesians varies considerably. There are highly cultured Javanese leaders at one end of the scale and backward Dayak tribesmen, some of them still head hunters, at the other.

THE PHILIPPINES

The Republic of the Philippines consists of 7,100 islands with a total area of 116,000 square miles. The main islands are: Luzon (area 40,000 square miles); Mindanao (37,000); Samar (5,000); Negros (5,000); Palawan (4,500); Panay (4,500);

Mindoro (3,800); Leyte (2,800); and Cebu (1,700). In general, the relief is mountainous with wide coastal plains and valleys penetrating into the mountains.

Agriculture is the most important occupation, being carried on by small-holders, more than half the farms being less than 5 acres. The main crops are: rice (3 million tons); sugar (2,400,000 tons, 65 per cent. from Negros); coconuts (copra and oil—1 million tons); corn (1 million tons); bananas; sweet potatoes; and yams. The islands almost feed themselves.

Perhaps the best known product is Manila hemp, produced from the abaca, a member of the plantain family. It is a monopoly of the Philippines and Borneo, the former producing 125,000 tons a year. From it the finest rope is made. Cigar tobacco is another export crop (26,000 tons). Fruits (especially pineapples), nuts, kapok, coffee, cocoa, ground-nuts, ramie, and rubber are also grown. Livestock rearing is more important than in the other islands, pigs being especially numerous (6 million). There are also 3½ million water buffalo as well as numerous horses, cattle, and goats. Meat, dairy, and poultry production is increasing and improving in quality with the import of breeding animals.

Forty per cent. of the land is under forest, mainly hardwoods, and 160 million ft. of valuable timber is cut annually, a variety of mahogany being the best known. Rattan canes, plywood, pulp and paper, and furniture are important exports. Other forest products include resins, gums, and beeswax.

Fishing is the second most important occupation, for fish, especially tuna and sardines, is next to rice in the Filipino's diet. Inland ponds are also fished and there are large shrimp "farms".

The Philippines have great potential mineral wealth. Iron is mined in increasing quantities (over a million tons) for export to Japan; gold is mined in Luzon and Mindanao. The large output of copper from Cebu and quicksilver from Palawan is also exported, and chrome ore at 600,000 tons is produced at ten times the pre-war rate. There are indications of petroleum at several places. Other worked minerals are coal, asbestos, silver, and limestone for cement (14 million barrels). There are huge reserves of nickel and a start has been made in mining it on Monoe and Palawan.

Manufactures are increasing, chiefly dealing with the processing of agricultural products, *e.g.* sugar refining, ropes, tobacco, coconut products, rice mills, and pineapple canneries. Cottage industries are important still, being especially noted for embroidery in cotton and silk, the annual export being valued at about £3 million. Other cottage products are fibre mats and hats, pottery, and cloth. Many light industries have been established, including the manufacture of cycles, gramophones, pianos, and plastics.

Manila, the old capital, has a population of 1½ million. A new capital, Quezon (400,000), has been constructed nearby. Manila is on the west coast of Luzon and has an excellent harbour, sheltered by the Bataan Peninsula, and is the chief port of the Philippines. The only other towns of any importance are Davao (230,000) at the head of the long Gulf of Davao on the south coast of Mindanao, and Zamboanga (125,000) at the end of the long peninsula at the south-western end of the same island.

The total population is 39 million, an increase of 16 million over the 1948 figures, and giving a density of 336 to the square mile (166 in 1948). Two-thirds of the trade is with U.S.A.

CHAPTER XIV

THAILAND AND INDO-CHINA

Thailand or Siam

Thailand extends from the Middle Salween in the west to the Mekong in the east. It is mainly upland country apart from the lower Chao Praya Basin which is separated from that of the Mekong by a low and broken range which bisects the country from north to south. The former river is created by the joining of its two headstreams, the Ping and the Yom, at Nakon Sawan on the lowland. In their upper courses they flow through narrow valleys overlooked by steep-sided mountains. The Mekong forms the eastern boundary of Thailand over a considerable part of its course, and its chief tributary, the Mun, drains the plateau which forms the eastern province. Thus the country may be divided into four regions—the north-western mountainous area, the eastern plateau, the central plain, and the south-western peninsular area. In the south-west corner there is a portion of the Malay Peninsula which divides Lower Burma from Malaya. The climate is typically monsoon, the rains falling mainly between June and October.

Agriculture is by far the most important occupation and rice by far the chief product. It is of the very best quality and although it is the main food of the people, there is a large surplus for export. Altogether there are some 9 million acres under rice, yielding about 8 million tons. Maize is becoming increasingly important, the annual production having risen from 30,000 tons in 1950 to 1,000,000 tons in 1965. The completion of the Chao Praya Dam, 150 miles north of Bangkok, has enabled some 3,500 square miles of the central plain to be irrigated, has improved flood control and navigation, and provided hydro-electricity. Another scheme is at Korat on the western part of the Nun basin, where 30,000 acres are irrigated for rice, sugar, and bananas. It is an important area for cattle and poultry breeding. The eastern plateau is an infertile area of scrub and open parkland which is now gradually being brought under irrigation: tobacco

is a main crop here. The peninsular region is mainly important for rubber and sugar palms, from which brown sugar and an alcoholic drink is made. Rubber planting has increased in importance, the 1966 output being 220,000 tons. Many coconuts are grown on the coast, and other crops are cotton, sugar, pepper, and tobacco. For transport, bullocks, buffaloes, and elephants are used.

About 60 per cent. of Thailand is forested. In the northern mountains there are dense teak forests. When the rivers are full in summer the logs are floated down to Bangkok by the Menam, to Moulmein (Burma) by the Salween, and to Pnom Penh (Cambodia) by the Mekong. About 45,000 tons of teak are exported annually.

Fishing is carried out in coastal areas, especially in the south-west. Here the villages, like those in many parts of the East Indies, are built on stilts to avoid floods, with slits in the floor for the rubbish to be dropped through so that it may be carried off by the tide. Most of the fish are caught in great traps which cost about £1,000 each and are owned by syndicates of merchants. Rivers and ponds also abound in fish. The catch consists mainly of cuttle fish, mackerel, and crabs. Thailand is rich in tin and wolfram. The former is dredged in the peninsula, about 14,000 tons of ore being exported to Singapore, U.S.A., Brazil, and Holland. In addition, over 18,000 tons of tin are obtained by smelting in Thailand. Lignite is being mined at Mae Moh in the north, and this will enable power to be supplied over a wide area. Other minerals are antimony, lead, iron, coal, gold, silver, manganese, rubies, and sapphires.

Manufactures are in the development stage; the only export surplus being in cement. There are fish and fruit canning factories, cotton mills, rice mills, distilleries, tobacco factories, steel works, and match factories. Thermal power for the southern industries and for Bangkok is obtained from a plant at Yanhee. Bangkok has one of the leading Asian film industries. Very recent new industries are meat canning at Nakhon Ratchasima in the extreme west of the grasslands of the Nan basin, a tinplate factory on the island of Phuket, off the west coast of the peninsula, and a tapioca factory in the south-east of the peninsula at Cholburi. Chiang Mai in the extreme north-west has skilled workers in enamelware and silk.

The communications are well organised. There are about 2,000 miles of State railways, radiating from Bangkok northwards, north-eastwards, eastwards, and southwards along the peninsula to link up with the Malayan line to Singapore. All parts of the country are linked by roads, but many of them are of poor surface, although improving. In the north-east the 92-mile "Friendship Highway" built with U.S. aid under the Colombo Plan is doing much to open up the region, as is the East-West Highway in the potentially important lumbering and mineral area of the west.

It now seems likely that a ship canal across the Kra isthmus will be started within a reasonable time. Such a canal would probably adversely affect the trade of Singapore.

Bangkok (2,300,000), the capital, is situated some distance up the Menam River. It is the chief port, but is handicapped by the bar at the mouth of the river. However, a channel is being cut through this that will double the draught of vessels able to navigate the river, *i.e.* from 13 ft. to 26 ft. The population of Thailand is over 36 million, nearly all of whom are Buddhists. Like the Burmese, they are of Mongol race.

Indo-China

Indo-China is a convenient expression for the area of South-East Asia ruled by the French until after World War Two. It is now divided in the western part by the Khmer Republic (formerly Cambodia) and the war-torn kingdom of Laos and on the eastern seaboard by Communist North Vietnam and Nationalist South Vietnam.

The whole of the area, with the exception of the Khmer Republic, has been subject to the devastation and disorganisation brought about by almost continuous war since the Japanese invasion.

POPULATION IN INDO-CHINA

	AREA (sq. miles)	POPULATION	DENSITY (per sq. ml.)
North Vietnam	63,360	17,900,000	268
South Vietnam	65,726	14,200,000	216
Khmer Republic	69,900	5,750,000	80
Laos	91,400	2,500,000	24

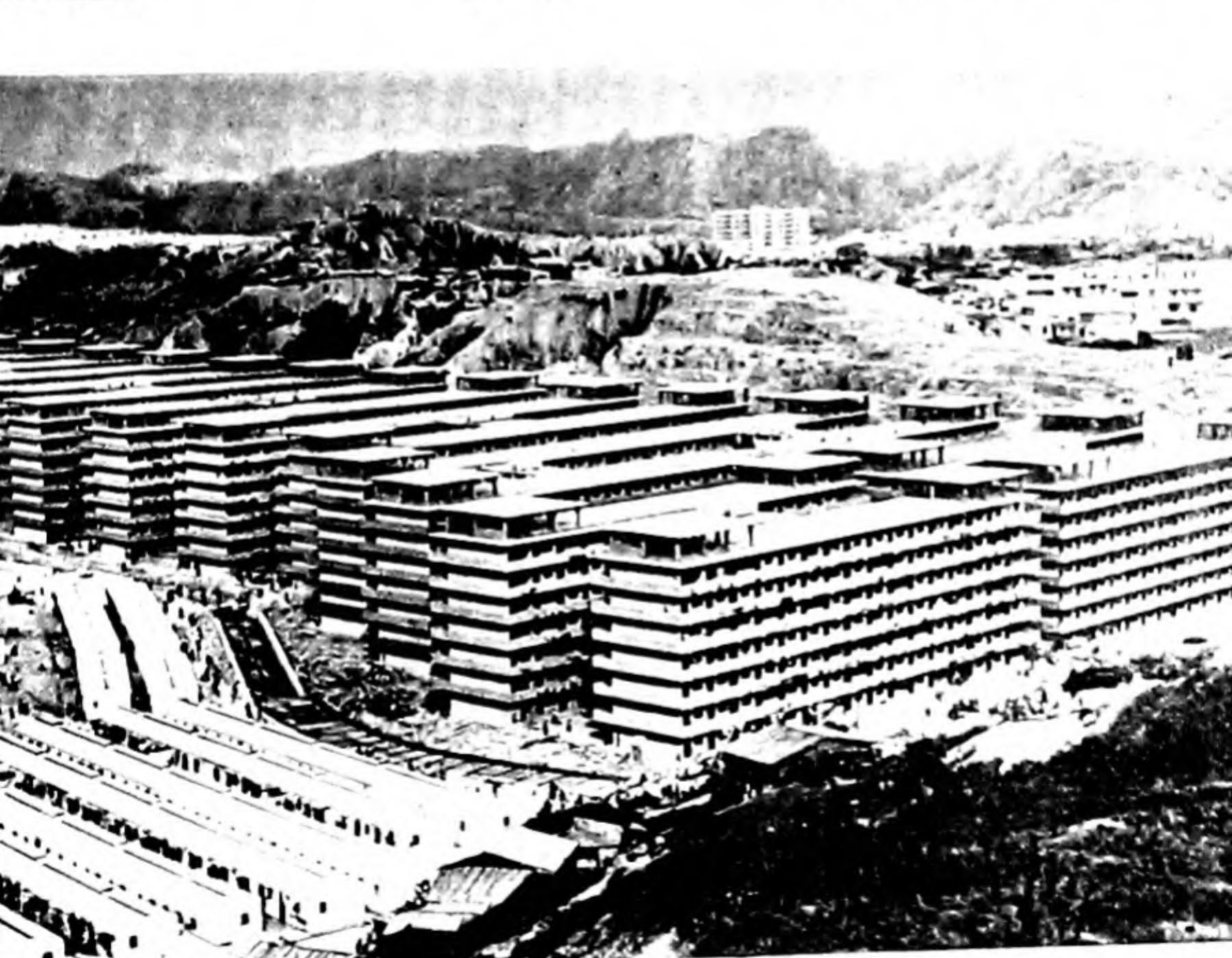
The economic details which follow must be read as dealing with normal times.

The "backbone" of Indo-China is a system of fold ranges which projects south-eastwards from a complicated and tangled series of ridges and valleys in Laos and north-west

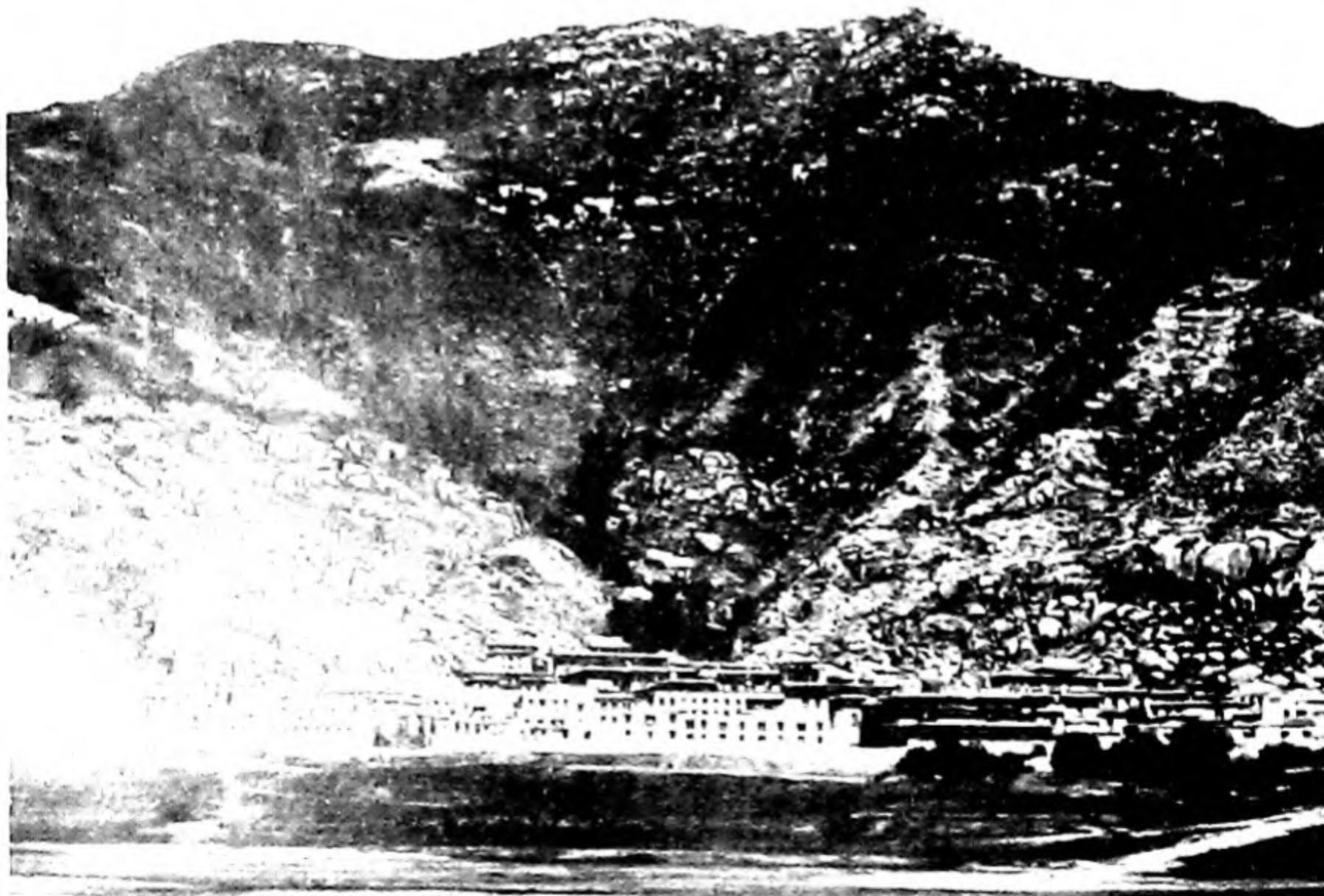
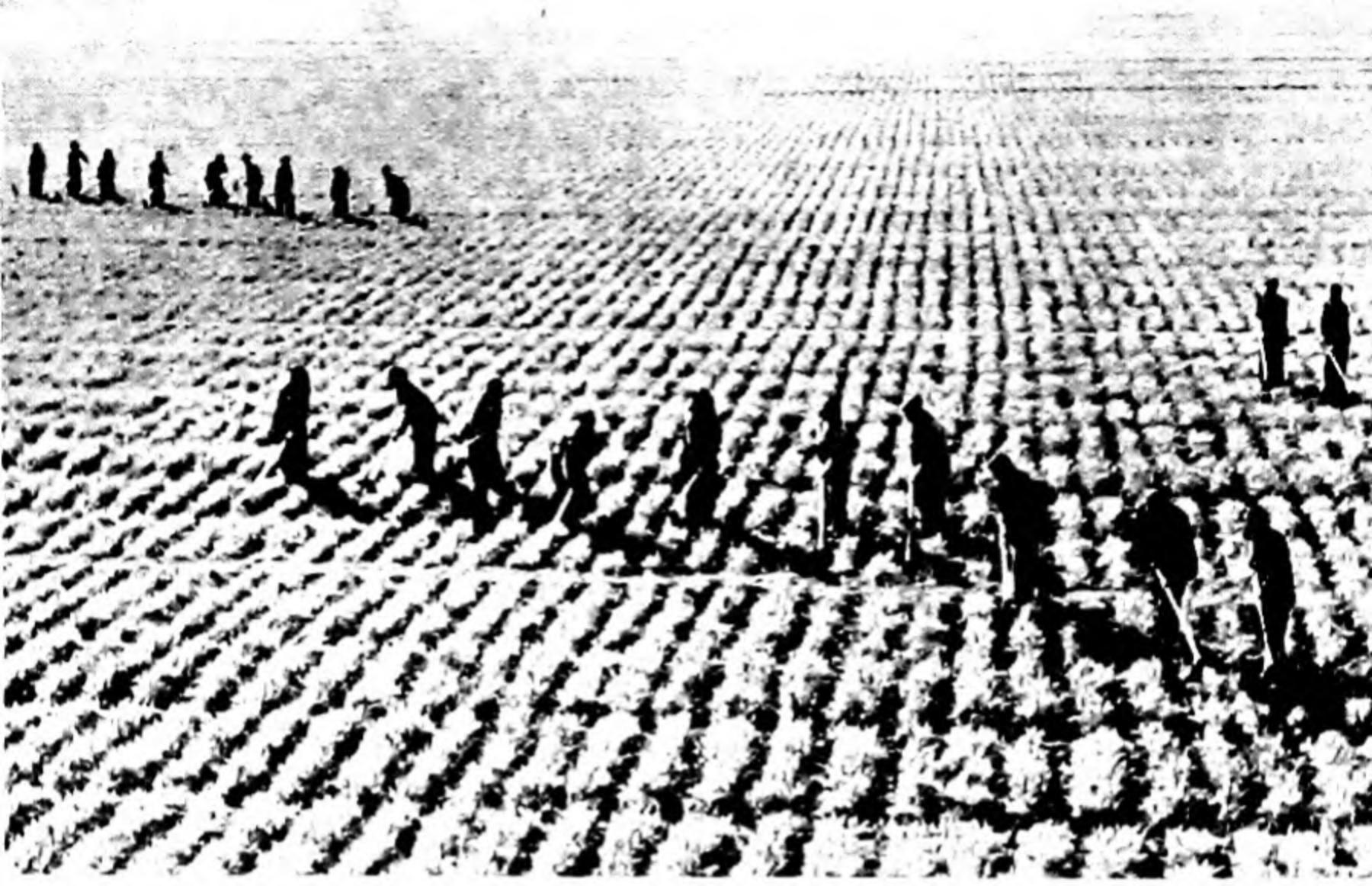


Fig. 37. DENSITY OF POPULATION IN THAILAND AND INDO-CHINA.

Vietnam. The ridges have an average height of 7,000 ft., the highest peak being Fan Si Pan in North Vietnam (10,309 ft.). This backbone forms the main watershed of the area. West of it, almost the whole of Indo-China is drained by the River Mekong and its tributaries. The only other well-developed river system is that of the Song-Koi (Red River) in the extreme north-east. Further south the mountains come so close to the coast that there is no continuous coastal plain



above: CHINA, SHANSI PROVINCE. CLIFF DWELLINGS IN THE LOESS. (Exclusive News Agency)
below: HONG KONG. A TYPICAL NEW HOUSING ESTATE, TO SETTLE SOME OF THE HUNDREDS OF THOUSANDS OF REFUGEES FROM COMMUNIST CHINA. (Hong Kong Government)



ABOVE: AT WORK IN A COMMUNE IN KIANGSU. WEEDING AND LOOSENING SOIL IN A CORNFIELD. NOTE THE VAST SIZE OF THE FIELD. (CAMERA PRESS.)

BELOW: TIBET. THE SERA MONASTERY AT LHASA. (EXCELSIOR NEWS AGENCY.)

and there is only room for a series of short, swift streams. These ranges form an effective barrier to east-west communications, and largely account for the sub-division into separate states.

Climatically, the area is monsoonal, but the mountain barrier has important effects. The lowlands have temperatures of 27°-32° C. (80°-90° F.) in July and the mountainous areas have 21°-27° C. (70°-80° F.). In January the whole of the north and the mountain backbone has 16°-21° C. (60°-70° F.), but the Mekong lowland is still relatively hot with 21°-27° C. (70°-80° F.). Rainfall occurs in summer over the whole of the area; the only part having appreciable falls in the winter being the north-east facing the winter monsoon. Amounts vary from nearly 200 in. in the north-eastern mountains to 40-60 in. in the south-western lowland. The natural vegetation is forest of varying density, apart from a relatively small region of savana in north-western Khmer Republic.

LAOS is an almost entirely mountainous country, which accounts for its low density of population. It may be divided into three: (1) a wide north-western area composed of range after range of mountains and covered with rain-forest and deeply cut river valleys; (2) a "panhandle", *i.e.* a long and relatively narrow strip of country extending to the south-east. It is over 600 miles long, and has an average width of 100 miles. It consists mainly of an escarpment falling away from the "backbone", which forms the eastern boundary, to the Mekong River, which forms the western. Laos has a small share of the Mekong lowland in the extreme south-west. Many tributaries cross the dipslope to join the Mekong; (3) The Bolovens plateau, a crust block in the south-east.

Most of the people are Laotians, a branch of the Thais. They live mainly in the valleys and grow rice for food and cotton and indigo for export. On the Bolovens plateau rubber, spices, and coffee are grown. The uplands are inhabited by Meos and Yaos, from Yunnan in south-west China. Their chief crop is opium, an important export mainly to South Vietnam.

Vientiane, the capital, is situated in the north-west in the valley of the Mekong on the Thailand boundary. It is connected by road with Bangkok. Further to the north, in the

heart of the mountainous country, lies Luang Prabang, the royal residence and religious capital. Xieng Khouang in the north-east is the chief centre of the opium trade.

KHMER REPUBLIC (Cambodia) is a well-defined geographical area consisting of the basin of the Lower Mekong, with the exception of the delta. Apart from the latter it is almost entirely surrounded by mountains. To the north-west the boundary with Thailand is formed by the low range of Phnom Dang Raek; to the west lies the broken but higher Chaine des Cardamones, which rises in Phnom Tumbol to over 5,000 ft.; and to the east the boundary with South Vietnam runs through the foothills of the "backbone". The Mekong plain is crossed by undulating hills from east to west. The river is wide and meandering, splitting up into channels at several points and bordered by "ox-bow" lakes. The Great Lake, or Tonlé Sap, in the west has an interesting régime. In summer the full Mekong ponds back its tributary, the Tonlé Sap River, so that it spreads out to form a great sheet of water. In the dry winter the water drains away from the greater part of the basin, leaving ponds in which large numbers of fish are trapped. These are salted or smoked mainly for export. Sea fishing is also important, as it is all round the Indo-China coast.

Rice is the most important crop, but its output is restricted owing to shortage of labour, an unusual feature in the Far East. Its yield per acre is low owing to haphazard methods of cultivation, for the people are easy-going. Pepper is grown widely in the south entirely for export, and there is a small rubber and coffee production. Sericulture (the rearing of silk-worms on mulberry leaves) is widespread, as it is throughout Indo-China. It is known that there are great resources of mineral wealth throughout the whole peninsula, and Cambodia in particular has great possibilities in phosphates. Jet is quarried.

The capital, Phnom Penh (400,000), is situated at the confluence of the Mekong with the Tonlé Sap. It has rice mills and cotton ginneries. Kampot, the chief port, has a silk industry. Pottery and rush mats are made at other centres. It is to lose much of its importance as a port to Kompong Som on the Gulf of Siam, from which a new highway has opened up a large area

of hitherto unused jungle for rice, pepper, and banana plantations, as well as for lumbering and saw-milling industries.

SOUTH VIETNAM may be divided into two parts:—

(1) The south-western lowland, which consists mainly of the combined delta of the Mekong and several lesser streams draining the southern end of the "backbone". This coincides roughly with the old territory of Cochinchina. It is extremely flat and is crossed by a network of irrigation channels. It is an ideal rice-growing area, but production is not so great as in pre-war days because the country is being devastated by war. There are many rubber plantations, and the normal annual export amounts to over 75,000 tons. Other products are cane-sugar (825,000 tons), coconuts, bananas, pineapples, sweet potatoes, and betel nuts.

Saigon, capital of South Vietnam, is by far the most important town and chief port. It is situated on the Saigon River, a tributary of the Mekong delta. Immediately opposite is Cholon, an industrial centre with saw mills, soap factories, rubber and tyre factories, and fruit preserving factories. Power is obtained from the Thu-Doc thermal plant and the Danhim Dam. The combined population is 2,000,000.

(2) The much larger mountainous area, which very nearly coincides with the former province of Annam. The coastal plain is narrow and broken, and it is here that most of the people live. Along the plain passes the "Mandarin Way" which leads from the Chinese border to Saigon. This road enters Annam by the Gate of Annam, which is only a narrow ledge between the mountains and the sea. Behind it are the mountains, inhabited by the Mois, a primitive people who still use poisoned arrows and whose only cash crop is opium. On some of the seaward slopes tea is grown, but timber and mineral wealth are the chief economic assets. Gold, copper, zinc, and coal are mined. There are nearly 1 million head of cattle in Annam, mainly in the coastal areas. Rice is again the chief crop, especially in the valley of the Phanrang River in the south-east, where 6,000 acres are irrigated.

The only important towns are Hué (100,000), which is situated at the southern edge of the largest of the coastal plains, and the port of Tourane.

NORTH VIETNAM consists of Tongkin and part of Northern Annam. It is an undulating area drained by the Red and Black Rivers, which unite to form a common delta. The extreme north consists of a limestone region, whose chief characteristic is the enormous blocks of limestone standing 100 ft. high and riddled by caves and tunnels—a typical karst which extends into Southern China. There are quarries—the stone being used for building and cement. Other minerals are tin and anthracite, much of the latter being exported to Japan. In the valleys, and especially in the Red River delta, rice is the chief product, but arrowroot, sugar, maize, tea, coffee, and tobacco are also produced. Castor oil is exported as well as lac resin for paint making. The former is obtained from the seeds of the castor oil plant, a small tree. It takes about 100 lb. of seed to yield 5 gallons. The oil is also used in lamps. Lac resin and dye are derived from insects which swarm on trees, excreting a resin to protect themselves. This is collected and melted to form shellac.

The capital, Hanoi (850,000), is one of the finest cities of the Far East. It is situated at the head of the Red River delta, a very over-crowded area where the population density is over 1,000 per square mile. The chief port is Haiphong at the mouth of a delta distributary.

CHAPTER XV

PEOPLE'S REPUBLIC OF CHINA

China is divided into twenty-two provinces. There are also five autonomous areas under Chinese control, including Tibet and Inner Mongolia.

The area of China proper is 3,600,000 square miles, so that from the point of view of mere size it has a better claim to the title "Sub-Continent" than India, which is nearly 2 million square miles. On the other hand, it is not nearly so isolated from the rest of Asia as is India, especially in the north.

It extends from latitude 20° N. to latitude 54° N. and from the edge of the Tibetan Plateau to the East China Sea. In the north-east there is an undulating lowland drained by the Lower Hwang-Ho and Middle and Lower Yangtse Rivers. Around this there is a crescent-shaped area of highlands extending from the south-east coast westwards across the country as the Nan Shan Range, and rising steadily towards the west where large areas of Yunnan exceed 6,000 ft. and the Tailang Shan is over 12,000 ft. Along the western edge the Red Basin of Szechwan and the corrugated uplands of Shensi and Shansi overlook the lowland gradually hemming it in towards the north-east so that in the former province of Manchuria it is a mere coastal ledge, at the point where the Great Wall reaches the sea. In the extreme south of China the Si-Kiang and its tributaries have carved the upland areas into numerous ridges and valleys. The coast is much indented especially in the south-east where there are innumerable relatively small capes and bays as well as islands. Of the islands, the only large one is Hainan, much of which is mountainous (Wuchi Shan, 5,800 ft.).

In the north-east there are larger indentations, such as Hangchow Bay and the Gulf of Chihli. The most prominent coastal feature here is the mountainous Shan Tung Peninsula. This was once a group of islands, but the enormous amount of silt brought down by the Hwang-Ho has converted it into a peninsula.

Manchuria may be divided into four main regions: (1) the Western Mountains, the Khingan; (2) the Central Lowland drained chiefly by the Sungari River to the north-east, but with a smaller basin in the south-west drained by the Liao-Ho into the Gulf of Liao-Tung; (3) the Eastern Ranges formed by the Little Khingan Mountains and the highlands bordering Korea. These are separated from each other by a wide gap cut by the Sungari on its way to join the Amur which forms, with its tributary the Ussuri, a large part of the Manchurian boundary. The southern half of the Amur Basin forms the fourth region, the North-Eastern Lowland.

Drainage

The rivers of China play such an important part in the lives of the people that they are worthy of special mention. The Hwang-Ho or Yellow River rises far away on the north-eastern edge of the Tibetan Plateau in the province of Chinghai and makes a very winding course to the north-east, where it crosses the loess plateau of Inner Mongolia and several times splits up into many channels. This loess is a vast deposit of wind-borne material, the accumulation of many thousands of years brought by the north-west winds blowing from the Gobi Desert. Every year a new layer settles upon the old deposits and the scattered coarse grass forces its way through. The old stems decay, leaving cylindrical pipes which honeycomb the loess. This makes it extremely loose, as its German name indicates, so that rivers cut deep gorges and any regularly used track quickly becomes worn below the general level to form "hollow" (i.e. hidden) roads. In the sparsely-populated area most of the people are cave-dwellers.

It then turns eastwards and southwards until it is joined on its right bank from the west by the Wei-Ho, after which it turns suddenly eastwards again. The Wei-Ho must have at one time been the main stream but it has long since been beheaded. However, its valley forms part of the caravan route between China and Central Asia. Soon after this influence the Hwang-Ho enters its flood plain. It brings down a million cubic yards of yellow silt annually from the loess area, and has built its banks well above the surrounding plain. Periodically it bursts these banks and floods huge areas, causing great damage and loss of life. It is estimated

that on several occasions the floods have caused the deaths of over 1 million Chinese, so that the river has earned the name of "A Hundred Sorrows". One curious feature is the way in which, after flooding, it has several times changed its mouth from the north side of the Shantung to the south. Until recently the people's only defence has been to add to the

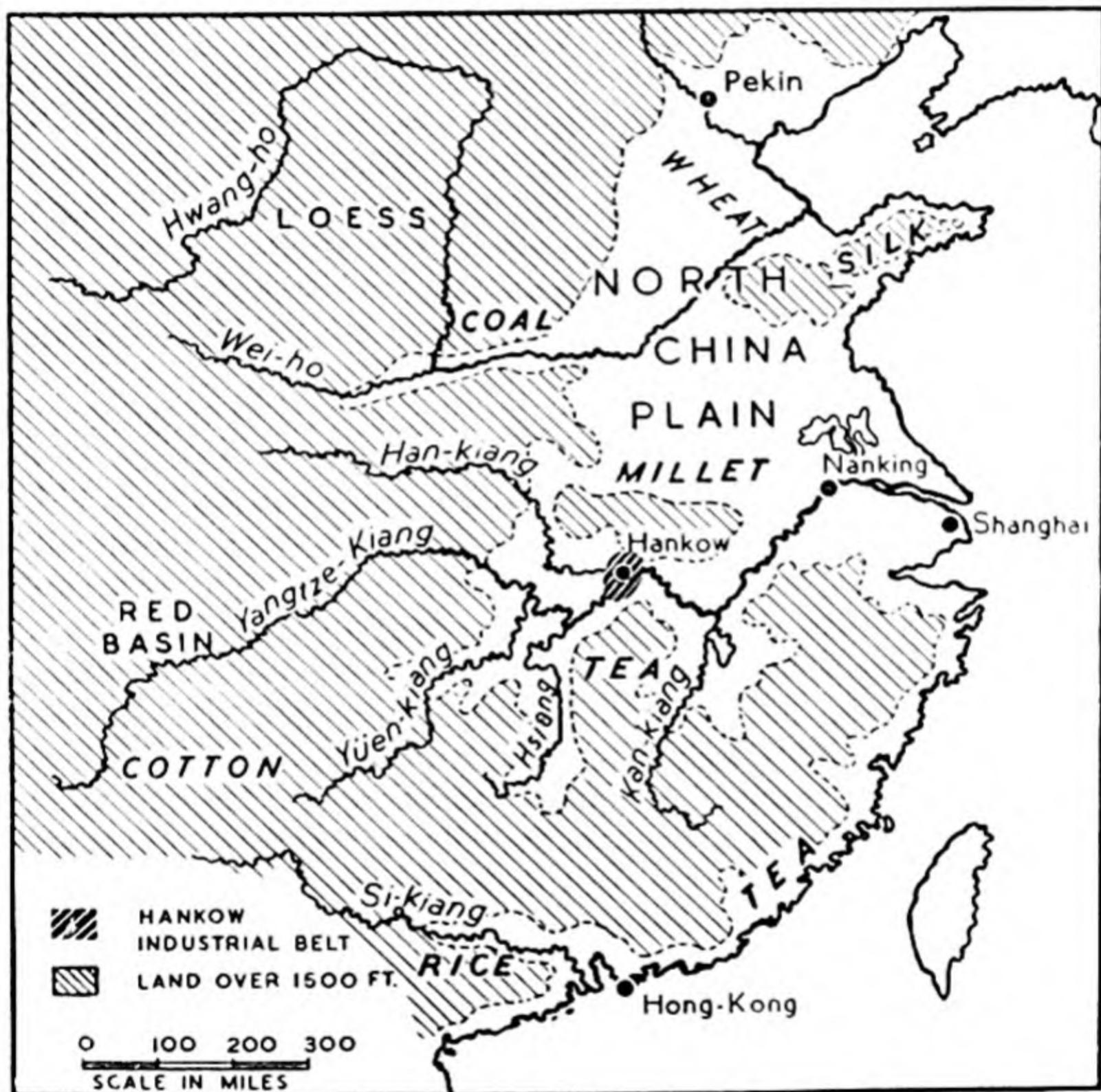


Fig. 38. CHINA—RELIEF AND PRODUCTS.

dykes, but all too often this was of little or no avail. But now the dams of the Sanmen Gorge should do much to prevent disaster (see p. 174). The floods are caused by the melting of the snow in the upper basin in spring.

The Yangtse Kiang also rises in the north-east corner of the Tibetan Plateau but it soon turns southwards,

flowing in a deep and narrow valley close to the Mekong and the Salween. On entering Yunnan it makes several "fish-hook" bends, signs of river-captures, and then turns north-eastwards to Szechwan where it crosses the Red Basin and receives several important tributaries such as the Min Ho which forms an inland delta or alluvial fan at the point where it leaves its mountain course for the comparatively level plateau. Leaving Szechwan by a gorge, the Yangtse enters the lowland and describes a zig-zag course along the northern edge of the South China Highlands. A feature of this part is the many large lakes, especially along the southern side, *e.g.* Tung Ting and Poyang Lake. These are caused by the parent stream having built up a much higher embankment than its tributaries so that these waters are ponded back until they have reached a sufficient level for them to flow away.

Climate

Climatically, of course, there is great variation between north and south, and between inland and coastal areas. There are six main climatic regions, viz. (a) The extreme south which is of the monsoon type, with hot summers, warm winters, and a pronounced maximum rainfall in summer. It is also liable to equinoctial typhoons. This region roughly coincides with the basin of the Si-Kiang and includes the island of Hainan. (b) The south-eastern coastal area which has given its name to the China (or Natal) type of natural region (see p. 40). (c) The Yangtse lowlands, where the winters are cool (January temperature: 40° F.) and the summers are hot but there is still a summer maximum rainfall. (d) The Hwang-Ho lowlands with cold winters and hot summers and fairly heavy summer rainfall and winter snow. (e) The Plain of Manchuria, which may be grouped with the Prairie type (see Mukden, p. 26). (f) The interior uplands, which are even more extreme in temperatures and have a light summer rainfall with amounts varying according to exposure and distance from the sea.

Agriculture

By far the most important occupation is agriculture, and it is here that the most remarkable changes have been brought

about by the Government. Until recently, Chinese farming was really horticulture, *i.e.* cultivation of gardens rather than of fields, for nearly the whole of the arable land was in the form of small-holdings. The title of F. H. King's well-known book about the Chinese, *Farmers of Forty Centuries*, gives the clue to the secret of the great skill which they have developed in the art of gardening—methods of cropping which have been handed down from one generation to another and improved upon in the light of experience. The Chinaman is tied very largely to his soil and to the home of his ancestors and is a child of tradition, which explains why ancestor worship plays such a great part in his religion. It also accounts for the great respect for, and loyalty to, the idea of the family, and it has made it difficult for a Central Government to foster the idea of nationality, but in this it has now wholly succeeded—at any rate with the younger people. The land around each village is now worked in common with large fields broken only by footpaths or drainage ditches. Of course, this applies mainly to the lowlands and plateaux, where the flat areas are sufficiently large. This extensive farming has resulted in increasing the cultivable area through the elimination of innumerable boundaries, and in greater efficiency through the better planning of crops, mechanisation, and the use of fertilisers.

The alluvial lowlands of the north-east form by far the most important agricultural area. Here wheat has for some time replaced rice as the chief food crop. The northern Chinese are of a hardier type than those of the south. They entered the country later and drove the original inhabitants into the southern highlands. The bleak winters and wheaten food have no doubt had a great deal to do with the noticeable differences in stature and powers of endurance. In Manchuria, too, agriculture is the outstanding occupation and very good crops are obtained, for the soil in the lowlands is extremely fertile. The chief crops are oil seeds ($4\frac{1}{2}$ million acres), soya beans (4 million acres), millet (4 million acres), and maize (3 million acres). Wheat growing has increased. The most characteristic product is the soya bean, for this was first cultivated in Manchuria. It is an extremely useful product because it can not only be ground into flour, but also yields valuable chemicals for a variety of industries, as well as oil.

These beans are grown widely in Northern China, which is the world's greatest producer, the Manchurian yield alone averaging 140 million bushels. Between the two world wars the population of Manchuria was trebled, mainly through immigration of Chinese, and since it became integrated with China the rate of influx has increased. It is planned to bring 74 million acres of waste land, mainly along the western edge, into cultivation. Already this has been done with 5 million acres. It should, therefore, do much to solve the over-population problem in the Hwang-Ho basin. Incidentally, there are similar grasslands in Kansu and Western Szechwan to develop. In the south, upland or mountain rice is widely grown on terraced slopes as well as the alluvial type along the rivers. The total quantity of rice yielded is far greater than that of wheat, yet there is barely enough to go round and most people have to be satisfied with a small dish of rice and a tiny piece of fish for their only meal. In the north, oats, barley, maize, peas, and beans are widely grown, and in the south there are sweet potatoes. Vegetables are cultivated everywhere.

Of the other crops, tea and cotton are the most important. China is the world's largest grower of tea, but a high proportion is consumed within the country so that it does not rank with India and Ceylon as an exporter. "China tea" is smoke-dried which gives it a different flavour from that of India or Ceylon although these countries do prepare some tea in the Chinese fashion. The two chief tea-growing areas are the hill slopes overlooking the right bank of the Middle Yangtse and those backing the south-east coast. From the former some tea is still sent by the overland route to Central Asia and U.S.S.R. From the south-eastern area tea was exported to Britain, for it was from there that the tea-clippers used to race home from such ports as Foochow, Swatow, and Amoy.

China comes third in the list of cotton producers, yielding 2 million tons, as compared with 3 million tons from the U.S.A. Most of it is grown in the north-eastern lowland, but Szechwan is also important, the crop there being under irrigation. In Szechwan, too, many opium poppies are grown.

Sericulture, *i.e.* the production of silk cocoons, is an outstanding occupation in Central China, especially in the Lower Yangtse Basin. It is also carried on in Shantung. Other

farm products are cane-sugar and indigo in the south, hemp and flax in the north. China has lacked tropical products, but some of these are now being grown on the island of Hainan, *e.g.* coconuts, rubber, and pepper.

Of the animals, pigs are by far the most important, it being estimated that there are some 110 million. This is, of course, due to their scavenging propensities, for in China nothing can be wasted. (Pigs' bristles for brush-making now form an important export.) For a similar reason there are large numbers of chickens, some 250 million, as well as 56 million ducks and 11 million geese. There are also 65 million cattle, and over 100 million sheep and goats.

Mineral Wealth

Potentially, China is one of the wealthiest mineral countries in the world and is almost certainly the one with the greatest coal reserves, which are estimated at 250,000 million metric tons. There are well-established coal-fields in Liaoning (part of the old province of Manchuria) at Fushun and Fushin, and others in the provinces of Ho-nan and Shansi. The total amount of coal, most of it high-grade, mined in China in 1964 was 220 million tons, more than eight times that in 1949.

The iron-ore reserves are estimated at over 2,500 million tons. The most important centres are in Manchuria (Anshan and Penhsihu) and in Shansi. There are very high-grade deposits at Wuhan in the centre, and other fields are being developed in Hopei, Shantung, and Szechwan. Output of iron-ore is about 35 million tons and of pig-iron 20 million tons.

Petroleum has been found in several areas, the most promising being in the far north-western province of Sinkiang on either flank of the Tienshan Mountains in the Tarim and Dzungaria basins. It is already being mined in the Yumen district of Kiangsu on the northern flank of the Nanshan range and at Yenchang in Shansi. Shale-oil is obtained from deposits above the coal measures at Fushun in Manchuria. The total yield of petroleum, however, is only about 8 million tons.

Tin is mined in Yunnan, mainly at Nochin, most of the ore, amounting to 4.5 per cent. of the world's total, being exported. Antimony (60 per cent. of world production) is also exported. Tungsten, amounting to nearly half the world

production, is mined in Kiang-si, Hu-nan, and Kwangtung. There are large reserves of bauxite, which yields aluminium, in Manchuria and Shantung. At Shih-Mien-Chung, in Szechwan, there has been a rapid development of asbestos mining. There are now over 50,000 people living there, whereas up to 1952 there were but a few huts. The asbestos is exported to Europe. Other minerals being developed in various parts of China are molybdenum, gold, and bismuth.

Manufactures

A great deal of importance has been placed on the development of manufactures, particularly of iron and steel goods and machinery. Indeed, some experts consider that this has been given too much weight in the Five Year Plans, and that greater attention should have been given to the improvement of agriculture, flood control, and irrigation. Many towns have increased their population very greatly, and several entirely new towns have arisen. In the period 1950-55, 30 million people left the country to live in towns. Even in manufacturing the idea of the commune has been developed, not only in large factories but also in suburbs, where workers, mainly women, are organised to work in groups in small factories using waste material from the larger ones to make small articles. Of the older industrial centres, Shanghai was the most important, having large iron-smelting plants as well as cotton mills, the raw cotton being brought from Szechwan, and rice flour mills. Recently, many new industries have been started, mainly for light articles such as fountain pens.

Of the iron and steel industries, the oldest established is at Han-yang on the Middle Yangtse River, which was developed by Chinese capital and uses local coal. The most modern and important of the industries of this type are to be found in Manchuria. Here the Japanese, who ruled Manchuria as a puppet state, which they called Manchukuo, before and during the Second World War, organised the power resources of the country, obtaining it from hydro-electricity, oil, and coal. The most ambitious scheme was that of the Hsao Fung Maon Dam on the Sungari River just above Kirin, which impounded 14 billion cubic feet of water. It was not completed until after the War.

Industries developed by Japan were: textiles, chemicals, and cement, at Shenyang (Mukden); steel, aluminium, cement, railway rolling stock, at Fushun; steel, at Anshan; synthetic rubber, cement, at Kirin.

When the Russians entered the country there was much confusion, and this has increased because of the civil strife between the Chinese Nationalists and Communists. Many mines and factories had closed down largely because the Russians carried off machinery as reparations, but much has been done to restore the industries, *e.g.* steel-rolling mills, seamless tubing mills, and blast furnaces have been opened in Anshan.

Since then, development has been carried much further, and Manchuria is now the most important manufacturing area of China. The chief centres are Anshan, which produces 5 million tons of iron and steel; Harbin, which makes electrical equipment and boilers and has an arsenal; Shenyang (Mukden), with aircraft, machine tools, and machinery industries; Fushun, which manufactures high-speed steel and aluminium goods; Fuleishi and Tsitsihar in the north-east with heavy machinery industries; and Changchun making lorries and cars.

One of the most striking developments is being carried out at Paotow, on the northern side of the great bend in the Hwang-Ho in the Gobi Desert, which until 1950 was mainly known as the terminus of the railway from Peking. Iron-ore was discovered in that year on a poor pasture land nearby known as the Pai Yung Ngau Po Shen, a range which is said to be composed almost entirely of iron-ore. Very fortunately, a coal-field yielding coking coal was discovered not 20 miles away. The region is destined to become a centre of heavy industry. Already there are tanneries, brick and tile works, an oxygen plant, and building materials are being made, all with a view to the future development of the heavier industries. There are also a sugar refinery, a shoe factory, and food processing, timber, and tailoring works. The population of Paotow has grown from 90,000 to over 500,000 in about six years.

Still further west, in Kansu, on the Upper Hwang-Ho, over 1,000 miles from the sea, there is another important development area based on the city of Lanchow, where a large oil-refinery planned to refine 3 million tons of crude oil a year

is now operating. Power is obtained for this and other industries from the Lung-Yang Gorge to the west of Lanchow on the Hwang-Ho near Kweiteh. It generates 1 million kW. Incidentally, shortage of power is one of the major hindrances to industrial development, and to meet it there is to be, in addition to the above, a network based on Urumchi in Western Sinkiang, the Sanmen and the Liuchiu Gorges on the Hwang-Ho, as well as on the Hsinan-Kiang in Chekiang and on the Yeli River in Yunnan. There are also five hydro-electric dams under construction on the Upper Heiliang-kiang (Amur) in Manchuria. As an example of the type of work which is being done, we will take the Sanmen Gorge. Sanmen means "three gates", because the river is divided by two islands in the gorge which has been cut in a huge natural basin of loess. Here a dam has been built 2,600 ft. long and 500 ft. high. The valley above it has been flooded for a distance of 160 miles. Not only is over 1 million kW. of electricity being generated, but also a huge area irrigated and flooding controlled. The importance of the latter may be judged when it is realised that the river has flooded its lower basin 1,500 times and changed its course 26 times in the last 3,000 years. Another advantage will be that the Hwang-Ho will be navigable to the sea.

Above the dam, some 20 million acres are being irrigated. Trees and crops are being grown to retain the soil, and gully erosion is being stopped by placing stones along the gullies. Already a great change has come to the way of life of the half a million local inhabitants, who have had to be moved to sites often a hundred miles from their old homes which have been engulfed by the reservoir. To serve the area and to develop manufactures deriving power from the dam, a new city of Sanmen has sprung up (population in 1959, 200,000). Further to the east, Loyang manufactures cotton textiles and textile machinery; and Chengchow, tractors, mining machinery, and ball-bearings.

We must bear in mind that at the present time (1967) there has been a slowing down in the development of manufactures particularly of the heavy types and of large hydro-electric and irrigation projects. This has been caused partly by the withdrawal of Soviet technicians and material aid and partly

by the priority given in the current five years plan to agriculture and light industry.

Population and Towns

The total population of China is estimated at 750 million (1971), which gives an average of 206 to the square mile. There is an average annual increase of 12 million. As the area includes many sparsely-populated districts, it is obvious that the density is much greater than 200 in the alluvial lowlands. Thus in Anhwei (Lower Yangtse) it is over 400, in Chi Kiang over 500, in Kiang-su over 800. By far the largest city is Shanghai (population over 6 million). It owes its importance to the fact that it is the principal outlet for the considerable foreign trade of Central and North China. Its fine Bund, or water-front, compares favourably with that of European and American seaports and is more Western than Oriental in its appearance. This is because it was developed by foreign commercial interests (British, American, French, Japanese, etc.). It is not situated on the Yangtse, whose mouth is silted up, but on a smaller stream, an outlet from Lake Tai Hu. It is the obvious outlet for the Yangtse Basin and has important cotton and rice milling industries.

Peking was until 1928 the capital of China and is so once again. It has a population of nearly 3 million which makes it the second largest city. It was established by the Manchus as their capital. Note that it stands at the northern end of the Chinese lowland, *i.e.* on the side from which the conquerors entered the country. In this respect it is similar to Old Delhi, Dublin, and many other capitals established by invaders, as well as to Sian on the Wei Ho, which was the Mongol capital on the threshold of China. Tientsin, the port for Peking, has a population of over 3 million, and is situated some distance up the Pei-Ho at the confluence of four streams, including the Lao-Chang-Ho from the south. It is linked by the latter with the Grand Canal so that it is the northern terminus of the great inland waterway which crosses the country to Hangchow, south-west of Shanghai. The Chinese use their rivers to a great extent for all forms of transport so that they have an abundance of east-west communications. It is for this reason that their chief railways run north-south, notably the Peking—Hong Kong line.

When the Manchu dynasty was overthrown in 1912, and the Republic took its place, it was natural that a change of capital should be considered, partly because Peking was too far from the centre of the country and partly because of a natural desire to break with tradition. No doubt the isolated position of Peking had much to do with the Emperor's loss of touch with his people and so made the task of the revolutionaries easier (cf. Petrograd under the Czars). In 1928 Nanking became the new capital and it is obviously a better site, for it is on the central river, the Yangtse, and within a fairly easy reach of the northern plain and of the south-eastern coastal areas. The only densely-peopled area with which it is not in good communication is the Si-Kiang Basin. The population is over 1½ million. But the force of tradition has proved too strong and the Communist Government has re-instituted Peking as capital. It may also be significant that it is in the part most accessible to U.S.S.R. Another Chinese capital is the wartime one of Chungking, which also has a population of just over 2 million. When the Japanese invaders overran the lowland the Chinese Government and large numbers of peasantry withdrew to the western plateau of Szechwan to carry on resistance from there. This is an ideal stronghold for it is ringed by mountains, the only important break in which is formed by the narrow Yangtse gorge which emerges on to the lowland at Ichang, former limit of navigation for river steamers from Shanghai. The upper river has been canalised to allow river steamers to reach Chungking, at the confluence of the Yangtse and the Kailing, the natural centre of routes of Szechwan and terminus of the Burma Road.

The most interesting urban development in China has been that of the three towns Hankow, Han-yang, and Wuchang, now combined into the single city of Wuhan. It is the only large-scale industrial conglomeration comparable, e.g., with our own Stoke-upon-Trent, once the Five Towns. The towns are in the centre of China and of the Yangtse Basin; they are in the midst of a network of waterways, including a veritable Lake District; they are at the point where the great east-west highway (the river) is crossed by the north-south one (the railway), and they are in the centre of the coal

and iron bearing region. The combined population is over 2 million.

Kwang-chow (2,100,000), formerly called Canton, plays the same part for the south as Shanghai does for the centre and Tientsin for the extreme north. It is situated at the head of a long estuary at the point where the Si-Kiang flows in from the west and the Pei-Ho from the north, so that it is the natural outlet for the trade of both basins. It has a paper-making industry.

Between Hong Kong and the great Bay of Hangchow the highlands come close to the sea, but here and there rivers, fed by the heavy summer rains, have vigorously eroded their basins, giving routes into the interior. At their mouths a series of ports has developed, of which the chief examples are Swatow, Amoy, Foochow, and Wenchow, the last-named being the largest (population 700,000). There is a food-canning industry at Swatow.

Most of the people of China live in tiny villages and hamlets and a surprisingly large number on house-boats or sampans. This latter applies particularly to the great ports, *e.g.* Kwang-chow, where many of them get their food by netting scraps thrown overboard from the shipping in the harbour.

There are, of course, many other large cities in China, but we have space for just a few of the more interesting ones. In the extreme west of Sinkiang is the ancient caravan centre of Kashgar. It is one of a series of oasis towns situated round the edge of the Tarim Basin, an almost rainless depression surrounded by mountains, the Tien Shan to the north and the Kun Lun to the south, and the Pamir Plateau to the west. In the Kashgar Oasis the population is 1 million, the town itself having 150,000 inhabitants. Recently, under Chinese influence, collective farming has been introduced and irrigation extended to improve the grazing for cattle, sheep, goats, camels, and horses. It is the centre of an important handicraft industry.

Another caravan route centre is Yarkand, situated to the south of Kashgar in another oasis. It is linked with Kashmir and Pakistan by passes over the Karakorams, open only in summer, although its trade has now gone. Its chief industries are hand-woven silk and felt hat making.

Lanchow, situated on the Upper Hwang-Ho, has already been mentioned in connection with industrial development.

It was at one time the most westerly point in China on the caravan route to Eastern Europe which was so important for the silk and tea trade. It is destined to be a great railway junction. It is the terminus of the line from the Eastern Plains and is linked with Paotow and Peking, and with Urumchi, capital of Sinkiang, to the north-west, and thence to join the "Turk-Sib" line in U.S.S.R. It is this line which will bring the Yumen oil to the refinery. Another line is to be built to Lhasa, capital of Tibet, with which it is already linked by motor roads. The population increased from 200,000 in 1953 to over 1 million in 1960.

Manchuria is well served by railways, the two main hubs being Shenyang (Mukden) in the southern basin and Harbin in the northern. These two cities act as the natural market and strategic centres of their respective lowlands. Shenyang is situated on the middle plain between the Liao-Ho and the eastern ranges, for the river is liable to flood and it flows through swampy country. The city is the largest in Manchuria, having a population of 2,400,000.

Harbin, the northern centre, has 1½ million inhabitants. It is a bridge-town on the Sungari and is on the direct route of the trans-Siberian railway to Vladivostok.

Other towns are Changchun (selected as capital of Manchukuo by the Japanese), which commands the easiest route between the two basins and with a population now estimated at 600,000; Antung, on a small plain in the extreme south-east; Kirin, at the outlet of the Upper Sungari from the mountains. The towns of Port Arthur and Dairen on the Kwantung Peninsula are now united as Lushun-Talien or Luta (population 1,500,000).

Communications

One of the chief reasons for lack of progress in China, particularly in out-lying areas, has been the poorness of communications, and much effort has been made to improve them. Until recently the Chinese relied mainly on their east-west river systems, supplemented by north-south canals and railways. The inland waters will, of course, always be of great importance. There are over 56,000 miles of navigable waterways, which are used by over 300,000 sailing junks as well as steamers which can navigate 16,000 miles. The chief

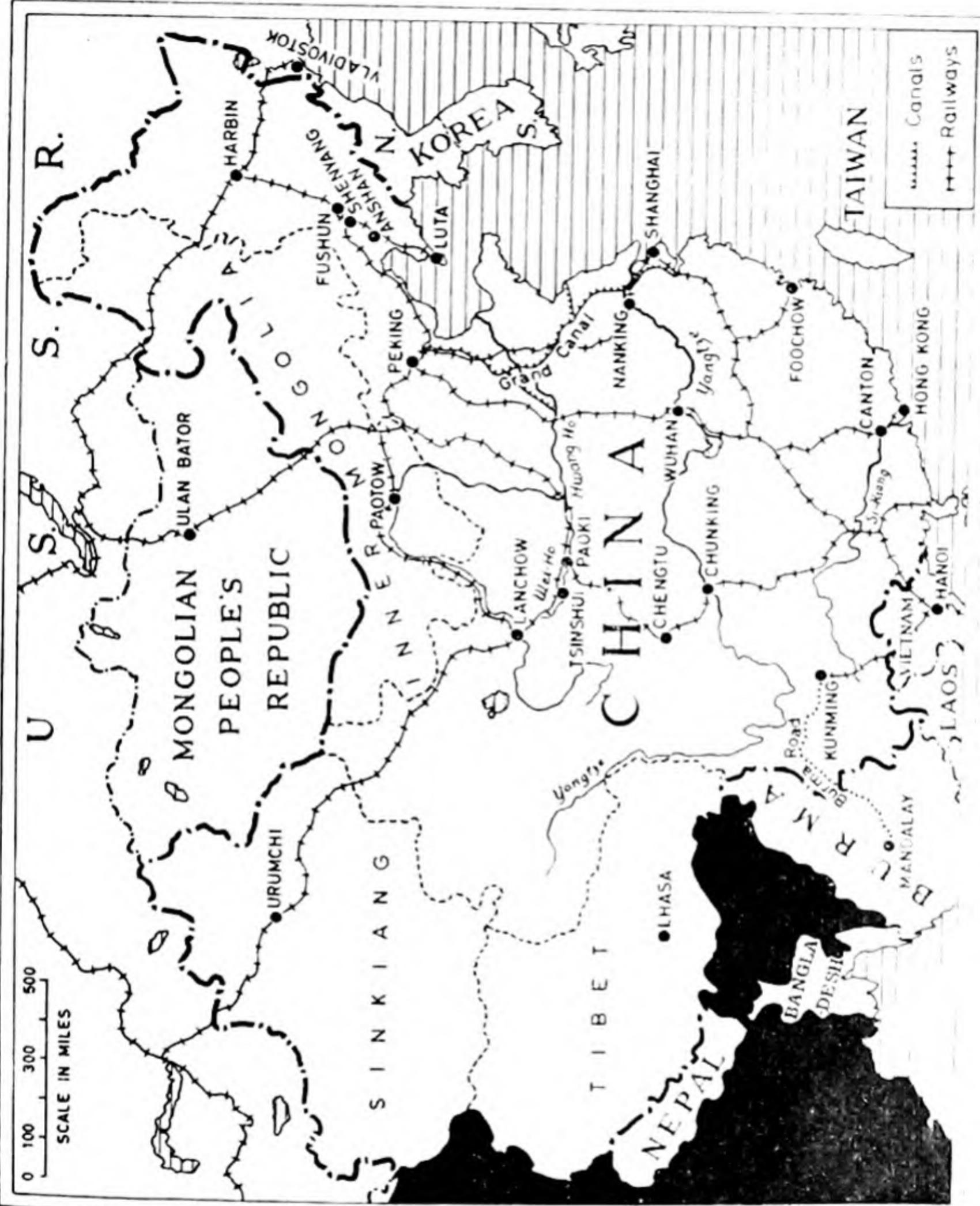


Fig. 39. CHINA—COMMUNICATIONS.

navigable river is the Yangtse, which can take vessels up to 10,000 tons as far as Wuhan, over 500 miles from the sea. The Grand Canal is the chief artificial waterway. It is over 500 miles long, and runs from south of the Yangtse nearly to Peking.

Many new railways have been built and still more are under construction. The original railway system consisted merely of main lines from Peking to Canton and Shanghai with east-west branches, *e.g.* to Tienshui. The latter has been extended to Lanchow, which has also been linked by a north-south line to Chengtu and Chungking. We have already noted the future importance of Lanchow as a railway junction. Other major developments have been the completion of the line from Chengtu in Szechwan to Paoki on the Wei River, tributary of the Hwang-Ho, and the commencing of the line from Chengtu to Kunming in Yunnan. As the latter is already linked with Hanoi, there will soon be a direct north-south route from U.S.S.R. to Vietnam via Kunming, Chengtu, Paoki, Lanchow, and Urumchi. West of Kunming, the capital of Yunnan, the country is very wild and undeveloped, the only means of communication being by the Burma Road which, in this Chinese section of 440 miles, is kept in good order. This road was built across most difficult country, range after range alternating with narrow valleys filled with fields of rice, tobacco, coffee, and vegetables, and each with its own small town, *e.g.* Paoshan, whose inhabitants are not Chinese but more akin to the Thais. Another line has been extended from Kwangsi to Hanoi, bringing the latter into direct rail connection with Peking via Wuhan, where a new rail-road bridge has been built across the Yangtse, thus obviating the use of ferries. Indeed, bridge-building has been another big task, four large ones having been built across the Hwang-Ho alone. Another has been built across the Sian-Kiang, tributary of the Yangtse, at Siangtan, the new industrial city of Hunan, west of the river, to link it with the Hankow-Canton railway. Thence, a railway has been built westwards to Kweigan in Kweichow to link up with the other main north-south line.

Tibet

In 1953, China invaded Tibet and established a communist government in place of rule by lamas, Buddhist priests, who formed about 20 per cent. of the population. Very few Europeans have penetrated into the country and little is known about such things as the exact population, which is now thought to be about 1,250,000. The country extends from the

Kun-Lun Mountains in the north to the Himalayas in the south, and for the most part is an inhospitable plateau of over 14,000 ft. above sea-level. Much of it is tundra with patches of ice-desert. There are numerous large lakes, *e.g.* Tengri-Nor, The only important rivers are the Tsang-Po, or Upper Brahmaputra, and the Upper Indus, both of which flow through deep and relatively narrow valleys. It is in these valleys that most of the people live, and it is only there that cultivation can be carried on. Barley and vegetables are grown and, in very sheltered parts, peaches and other fruits. Many sheep and yaks are reared, both for transport and for their wool. Shepherds take their flocks high up into the mountains in summer in search of pasture, an example of transhumance.

Most of the transport of goods is done by such animals as sheep, yaks, and crosses between yaks and cattle. The chief trade is with China which is more accessible than either U.S.S.R. or India. The routes to the latter country are across passes up to 18,000 ft. above sea-level, and traffic ceases during periods of heavy snowfall.

Lhasa, the capital, a town of some 50,000 inhabitants, is situated in a sheltered southward facing valley. The Lhasa River is being dammed to produce hydro-electricity.

Since the country came under Chinese control there has been a marked development of communications and industries. Thus, Lhasa is linked with Lanchow in China by a motor road with a regular bus service. This means a 1,200 mile journey which takes two weeks under good summer conditions. The road passes through little-known regions, and it is interesting to note that for part of its route in China it is paved with salt brought from Koko Nor, a large salt lake some 250 miles to the west. Nagchu Dzong, in North-Eastern Tibet, which lies on this route is becoming an important road centre, other roads leading to Ari in the west and the Tsaidam Basin of the mountainous Chinese province of Tsinghai to the north-west. Another road leads through Chamdo in Chinese Sikiang to Szechwan in the south-east. Near Nagchu Dzong coal is being mined, replacing the yak dung fuel which has been used hitherto. Yet another road has been built, almost entirely for strategic purposes, to link Lhasa with Kashgar. Part of this road runs through the isolated Indian territory of Ladakh, and the area has been occupied by the Chinese.

CHAPTER XVI

CHINESE FRINGE LANDS

Korea

Korea was annexed by Japan in 1910 but was taken from her in 1945 after the Second World War. It was intended that Korea should become an independent state, but as a result of the Korean War it was divided into North Korea and South Korea with the 38° N. parallel of latitude as a boundary. It is interesting to note that this boundary roughly divides the more productive "China type" rice-growing area of the south from the hillier "St. Lawrence type" of the north, and that as in China there is a difference physically and in outlook between the northern and southern inhabitants. However, when the hydro-electricity and mines of the north are fully developed the two areas should be complementary, and as the relief runs from north to south the frontier is purely artificial and in no way a barrier.

The Korean peninsula has an area of 85,000 square miles and may be sub-divided into two parts: (1) the mountainous north-east, *i.e.* the area north of latitude 40° where there are quite extensive mountain regions of over 6,000 ft. above sea-level and where there are very high cliffs along almost the whole of the extent of the coast line; (2) the peninsula which divides the Yellow Sea from the Sea of Japan and which is by far the more important region from the human and economic points of view. This peninsula has a "backbone" of mountains which keep well to the eastern side in the north, but in the extreme south they cross the centre. They give the impression that Korea turns its back on Japan, and, indeed, apart from the extreme south-east corner, nearly everything of importance is centred on the western coastal districts.

The western coastal area is an undulating country of rocky hills (spurs of the eastern ranges) and fertile valleys. Agriculture is by far the most important industry for there are 11 million acres under cultivation and 80 per cent. of the population live in the country.

South Korea

In South Korea the system of land tenure is interesting. Private landowners occupy the lowlands, but the mountain slopes are let to tenant farmers by the Government. This is because the former have been tilled for generations, but the latter, with the recent increase of population, have now been terraced and irrigated, necessitating control.

The chief crop is rice, which occupies about a quarter of the cultivated area. There is enough grown for the needs of the inhabitants and a considerable surplus for export to Japan. On the average the crop is about 100 million bushels. The straw is much used for thatching and the making of sacks, rope, and shoes. Other crops are barley, wheat, potatoes, sweet potatoes, and large quantities of vegetables, and there are extensive apple and pear orchards. Silkworms are reared and yield about 5 million pounds of silk annually. Good quality tobacco is grown, and processed at Sintajin.

The chief animals reared are cattle (about $1\frac{3}{4}$ million) and pigs ($1\frac{1}{2}$ million), the former being of a good type.

Along the coasts fishing is important (annual catch 700,000 tons). The waters are rich because cold and warm currents meet on the wide continental shelf. Off the east coast cod, cuttlefish, pollack, sardines, and herring are caught; off the west coast shrimps, corvena, and croakers; and to the south, anchovy and bream. Coal, iron, and tungsten are the chief minerals. Coal output is about 14 million tons, and includes anthracite. The world's largest output of tungsten is mined at Sang Kong. There are growing manufactures, including textiles (cotton, silk, nylon, and rayon) at Chosun. Rubber is manufactured at Pusan and oil is refined at Ulsan.

The capital and chief commercial centre of South Korea is Seoul (over 5,000,000), with its port, Chemulpo (Inchon). It is situated in a central position on the western lowland and is linked by railway with Shenyang (Manchuria) to the north-west; Fusan, the chief ferry port to Japan, in the south-east; Mokpo in the south-west; and Unggi in the extreme north-east. Pusan, in the extreme south-east of the peninsula, is an important port trading with Japan.

The population is 29 million at 297 to the square mile, increasing at 3 per cent. per annum.

North Korea

North Korea is about the size of England and has a population of 12 million. Fur trapping is important in the northern forested areas which also yield valuable timber (maple, pine, beech, and oak). The mountains are known to be rich in minerals but these have not yet been exploited because of transport difficulties. Some gold, molybdenum, and mica are mined. Fishing is important.

In the north-west, on the Yalu River, there are great hydro-electric plants which supply power to Manchuria. These were developed when Japan controlled both these countries, so that there was no question of international boundaries. Undoubtedly one of the causes of the fighting in 1950 was the fear that with complete United Nations success in Korea, Manchuria might be deprived of its chief source of power, thus crippling her growing manufactures.

The capital is Pyongyang, a bridge town just below the confluence of the Teadong and Nan Rivers.

Hong Kong

This British Crown Colony is composed of a group of islands and of Kowloon and the New Territories on the adjacent mainland. It is at the south-eastern end of the main estuary of the Canton River, and the main island, which is mountainous, is about one-quarter of the size of the Isle of Wight and is only a quarter of a mile from the mainland. Between Hong Kong Island and the mainland is the harbour, which is spacious and practically land-locked. Most of Kowloon is mountainous. The climate is of the monsoon type, with 75 per cent. of the rainfall of 85 in. falling between May and September, when there is a very high humidity (91 per cent.). The average temperatures vary from 15° C. (59° F.) in February to 28° C. (82° F.) in July. One serious disadvantage is the liability to typhoons, especially in its use as a naval base.

The population of Hong Kong has fluctuated greatly over the past thirty years. In 1931 it was 500,000, but in ten years it increased to 1,600,000, having received many refugees from China, fleeing from the Japanese. During the Second World War the latter occupied the colony and sent large numbers of these newcomers back to their Chinese homes, so that by 1945

there were only 600,000 inhabitants. With refugees from the Communists the population increased to 1,600,000 in 1946 and by 1971 to over 4 million, almost all of them Chinese. This has created problems of overcrowding, of food and water supply, and of employment. It must be realised that of the 391 square miles only 12 are available for residential purposes and 50 for cultivation, the remainder being either hillside or marshland. Thus, if the whole area is included the 1971 density of population was over 9,600 to the square mile, but if the residential area only is considered it would be over 300,000! Large numbers live in crowded huts made of tins, cardboard, or sacking, with great danger of fire and epidemics. Several disastrous fires have occurred. Much has been done to house the people in enormous blocks of flats, and mountain sides have been terraced and marshlands drained to increase the habitable area, but these can hardly keep pace with the increase in population (see Plate facing p. 128). An adequate water supply has been a great problem: there are no large rivers or underground sources. For a long time the colony had to store its rainfall but now China has agreed to provide about 15,000 million gallons a year from a specially-built reservoir not far north of the border. The new Shek Pih reservoir on Lan Tao Island provides more and River Cove in the New Territories has been dammed, drained of sea-water, and filled with fresh.

Employment has been found in various manufactures for about half the population. Of these, the oldest is ship building and repairing. There are also rolling mills for iron, steel, aluminium, and brass. The greatest expansion has been in textile industries, particularly cotton. There is a large export of grey cloth to Lancashire, and many shirts and singlets are made. Rope-making is important, the annual output being 24 million lbs. Other industries are cement milling, sugar refining, cigarette making, and the manufacture of shoes, enamelware, electrical goods, matches, furniture, and plastics, including great quantities of plastic flowers.

The staple foods are rice and fish. Only one month's supply of the former is grown on the mainland, the rest being imported from Thailand and Burma. Hong Kong has the

largest fishing fleet in the British Commonwealth (over 5,000 vessels), and there is a surplus catch for export.

Hong Kong is a great entrepôt port for China handling the bulk of the trade of the south. About 75 per cent. of its exports are its own manufactured goods, about one-third going to U.S.A. The capital is Victoria (1,000,000) on the sheltered northern shore of Hong Kong Island. It handles over 30,000 vessels a year, 9 million tons of cargo and 2½ million passengers. About 500,000 tourists visit Hong Kong each year and spend a large amount in purchases in the customs-free port. The airport of Kai Tah has a long runway on a reclaimed part of Kowloon Bay and is used by a further 700,000 passengers. Kowloon (1,500,000) on the mainland is the chief industrial centre.

Macao

Opposite to Hong Kong on the Canton River estuary lies this tiny colony of Portugal, consisting of 6 square miles of mainland and islands. It has a population of 250,000, and is chiefly important for trade with China, much of it illegal, and as a holiday resort for the Chinese.

Taiwan

A large island intersected by the Tropic of Cancer; it was ceded to Japan by China in 1895. It is now the only territory still under the control of the Chinese Nationalists, who have been driven from the mainland by the Communists. It has an area of over 13,000 square miles and a population of over 14 million, many of whom are Japanese colonists. There are 140,000 aborigines and nearly 2 million refugees from the mainland. The remainder are descended from the intermarriages of Chinese immigrants of long ago, and aborigines. Along the eastern half there is a high mountain system culminating in Mount Tung Shan (13,600 ft.). There is an extensive lowland along the west coast and it is here that the Japanese carried out most of their developments, clearing the forests for tea, sugar, and rice plantations. Rice and sugar-cane are the chief crops. Ground-nuts, soya beans, bananas, citrus fruits, jute, and tobacco are also grown. The Nationalists have started pineapple plantations and canneries, and are developing an export trade. Fishing is important, and has

recently been expanded by the purchase of up-to-date vessels. The most characteristic product is natural camphor, of which Taiwan has a monopoly. Some coal is mined. There is a chemical fertiliser industry and enough cotton goods are manufactured for domestic needs. Annual output of cement is about 1 million tons, and there is a growing aluminium industry. A railway runs along the middle ground at the foot of the mountains and links the northern port of Kurun (which serves the capital, Taihoku) with the southern one, Kaohsiung.

Mongolian People's Republic

Mongolia consists of a vast plateau of some 3,000-4,000 ft. above sea-level extending for 2,000 miles from west to east from the Tarbagatai Mountains to the Khingan Range. Its north to south extent from the Siberian border to the Nan-Shan Range is 1,200 miles and the total area is 1,875,000 square miles. This is divided politically between the Republic of Outer Mongolia, which is under Russian influence, but whose economic development is now being greatly aided by the Chinese, and Inner Mongolia, which is still part of China. Outer Mongolia is about ten times the size of England and has a population of about 1 million. In its north-western corner the plateau is intersected by the Altai Mountains.

Climatically the region is arid, the summers are hot and the winters are bitterly cold, especially when severe gales blow from the Arctic causing the temperature to fall to -45° C. (-49° F.). As a result of the low rainfall much of the eastern part of the area is covered by the Gobi or Shamo Desert, most of which is a rock rather than a sand desert, the top surface being a fine gravel. The most common vegetation is sage bush which grows to a height of about 8 in. Here and there are clumps of coarse grass and thorn bushes, the latter forming food for camels. Along the northern mountain slopes there are birch forests and at their foot there is good grass, especially where perennial streams leave the hills. The banks of these are lined with cotton-wood trees.

Outer Mongolia is one of the countries to which the phrase "The Changing East" could be most aptly applied. Until recently, most of its people were nomads, following their

herds of sheep, goats, and horses. Their ancestors, the Huns and the Tartars, broke out of their homeland in the 5th and 12th centuries, A.D., wreaking havoc wherever they passed. This applied especially to the Tartars, who destroyed famous cities like Balkh, Merv, and Baghdad, and ruined the irrigation system of Mesopotamia to such an extent that the area has never really fully recovered. Their descendants were short, sturdy and beardless, and had small eyes. They inherited bow-leggedness, as they were expected to ride almost before they could walk. They depended on their animals for their clothing, food, and shelter—sheep for wool, goats for meat, cheese, and butter. Goat hides were about their only export. Transport was almost entirely by camels, ponies, and ox-cart. The camels, of which there are still 750,000, are of the Asiatic species—the two-humped dromedary or Bactrian camel. The people nearly all lived in gors, and many of them still do. These gors are round, white felt tents made of camel hair or wool. The felt is stretched over a wicker frame, the whole structure taking less than twenty minutes to erect or dismantle—an obvious advantage to a nomadic people. For fuel they used only dried dung.

Nomadism is still the way of life of large numbers but there have been considerable changes. Large State collective farms have been formed, providing all the grain needed and leaving a surplus for export but pastoral farming is much more important than arable. Winter fodder is stored so that the herds do not have to wander in search of it. Although there are still camel caravans, much of the transport is by lorry.

The capital, and only large town, is Ulan Bator, with 220,000 inhabitants and growing rapidly. New industries have been established, including engineering, meat packing, wool spinning and weaving, and leather. Trunk roads lead from it to Barnaul and Irkutsk, in U.S.S.R., and to Peking. Railways link it with Peking, via the coal-mining centre of Nalaikha, and to the Trans-Siberian Railway at Ulan Ude. The country is more under Soviet than Chinese influence, both politically and commercially. To the former it exports wool and meat and receives in return machinery, tools, and oil products.

CHAPTER XVII

JAPAN

The Japanese Empire, once extending to the mainland and to Formosa, is now confined to the Archipelago which partly encloses the Sea of Japan, having lost 45 per cent. of its area as a result of the Second World War. It has an area of 143,000 square miles, $1\frac{1}{2}$ times that of the United Kingdom, and stretches 1,150 miles from north-east to south-west. It has 12,000 miles of coastline. It consists of four main islands: Honshu, Shikoku, Kyushu, and Hokkaido, of which the first-named is by far the largest as well as being the most important economically. There are thousands of smaller islands, including Okinawa, nearly 400 miles to the south-west of Kyushu. The group is obviously part of the chain of fold ranges which fringes the East Asiatic coast but which has been mainly submerged. As a result a high proportion of the country is mountainous. The earth's crust is very unstable so that there is great frequency of earthquake shocks, most of which are mere tremors. It has been said that at any given moment an earth movement is being felt somewhere in Japan. Sometimes, of course, the shocks are really serious and great destruction and loss of life are caused, as in the Yokohama and Tokyo earthquake of 1923, when 99,000 people were killed. The highest mountain is the dormant volcano Fujisan (12,375 ft.), famous for its perfect cone. It is, perhaps, the best-known mountain in the world, for its picture occurs in nearly every type of Japanese art. It last erupted in 1707. There are 192 volcanoes in Japan, 58 being active.

Owing to the narrow character of the islands there are no long rivers, but there are very numerous short and swift ones. Biwa Lake, north-east of Osaka, is the only lake of importance. The coast line is very greatly indented, a feature being the number of bays, some of which are almost land-locked, e.g. Kagoshima Bay on Kyushu.

Climatically there is a definite distinction to be drawn between the western and eastern shorelands. The former

have much greater extremes of temperature and a lower rainfall because of the landward facing position. They are fully exposed to the cold north-west winds of winter which blow outwards from the Siberian high pressure area. The snowfall is much heavier on this western side because the winds pick up moisture over the Sea of Japan. The eastern side is sheltered by the mountain backbone. There is also a general decrease in temperature from south to north and an increase in precipitation, especially winter snowfall. Rainfall is everywhere plentiful, ranging from 40 in. to 100 in. (Tokyo, 58 in.).

TEMPERATURE RANGE

	LATITUDE	MEAN	MEAN
		JANUARY	JULY
Kagoshima (Kyushu)	32° N.	4° C. (40° F.)	27° C. (81° F.)
Naha	36° N.	3° C. (38° F.)	26° C. (79° F.)
Osaka (Honshu)	40° N.	5° C. (42° F.)	18° C. (64° F.)

The country is particularly liable to destructive typhoons, which sweep in from the south-east, mostly in September and October, causing great harm from flooding and landslides.

Two factors have combined to cause a large proportion of the people to live on the Pacific coastal lowlands. Chief among them are: (1) the greater percentage of fertile lowland soil and (2) the more favourable climate. No doubt this preponderance of population on the seaward side had a great deal to do with the long isolation of the Japanese from the rest of the world, for the country turned its back, so to speak, upon the mainland and so intensified the natural tendency of an island people to keep aloof from its mainland neighbours.

The entrance of an American squadron into Uraga Bay in 1853 was an event of the profoundest importance in Japanese history, for it brought the country into contact with the outside world at a time when that world had developed its manufacturing industries on modern lines. It had also begun to develop its democratic way of life, whereas the Japanese were still living in the feudal system. The Japanese are a very imitative people, so they quickly learned the industrial methods of the outer world, but they retained in very large measure their own social structure on feudal lines.

Thus a people advanced in one bound by several hundred years so far as science and technology were concerned, getting the benefit of the slow evolution of ideas achieved by their teachers but without improving *their* own standard of living at anything like the same rate. This had a serious effect upon the world's markets, for they were flooded with very cheap Japanese goods, produced by workers whose average wage was very much lower than that of a Western worker doing similar work, to the consequent disadvantage of the very nations who had taught the Japanese their methods of production. To quote an important example, the Lancashire cotton industry lost a large part of its Far Eastern market. From the Japanese point of view, however, this industrialisation took place at a very vital point in their history, for the islands were beginning to be overcrowded and many people were living at a starvation level. As in the case of Britain to-day, they needed to export manufactured goods in order to buy food.

It was this same overcrowding that had a great deal to do with the Japanese acts of aggression, for they were seeking areas in which to settle some of their surplus population, but more important factors here were the need to secure sources of supply of raw materials, for the homeland is poor in these, and to obtain control of markets for their manufactured goods. Japan has to import all its cotton, wool, rubber, potash, phosphates, and bauxite and nearly all its petroleum, mineral ores, and salt. Raw materials account for 60 per cent. of its imports.

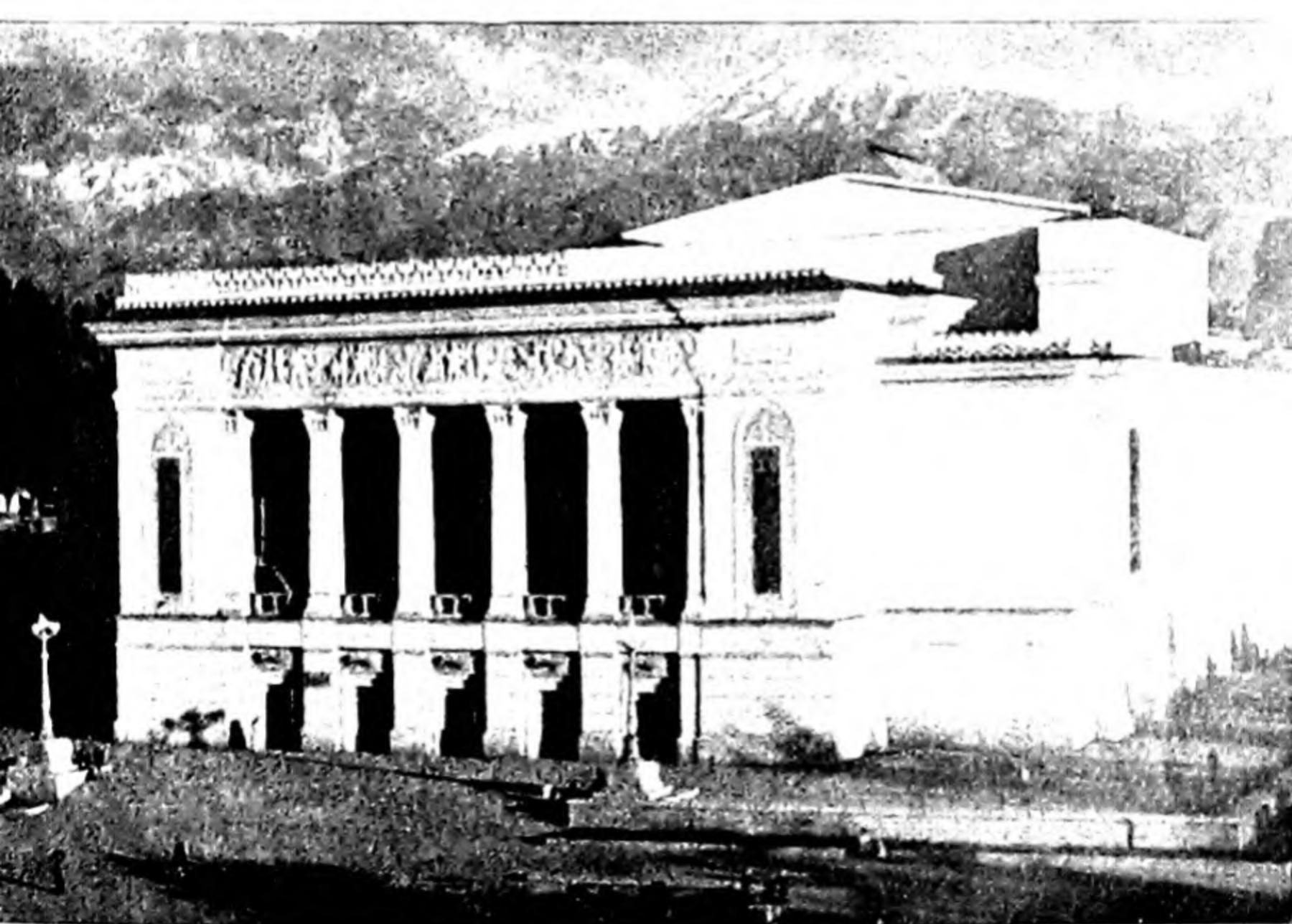
Farming

It is necessary to understand the foregoing points in order to appreciate the problems of the Japanese and to serve as a background in our study of the production and trade. By far the most important agricultural product is rice, the staple food, 16 million tons being produced from 7.5 million acres—the highest yield per acre in Asia. This has been achieved by the heavy use of fertilisers. Japanese experts have been sent to such countries as Pakistan to advise farmers about the improvement of their cultivation methods. In addition, wheat is sown as a winter crop to be harvested in May or June and yields $\frac{1}{2}$ million tons, a further 4 million tons being

imported. The rice is grown mainly in the valleys and plains, but even the hillsides are terraced. The method of hill terrace cultivation was probably introduced from Southern China or the East Indies.

Nearly a century ago a new variety was evolved which withstands the cooler summers, so that it is grown in Hokkaido beside oats and rye. Here, and in northern Honshu, the rice is grown as a single crop. It is sown in April, May being occupied in preparing the paddy fields for the transplanting of the young plants in June. In July and August the fields are kept weeded, and September is the harvesting month. Elsewhere, however, a double crop is obtained in some of the more southerly areas, winter wheat or barley being harvested in June. In such cases, rice is sown in nurseries in May, planted in the fields in July or August, the harvest being in late October or November. The best rice in Japan is produced in north-west Honshu, on the Shonai Plain, which is drained by the Mogami River. There is a yield of 70 bushels to the acre, grown on small-holdings of 5 acres. The annual crop averages 3½ million bushels, the bulk of which is sent to the Tokyo industrial belt. Winter wheat is a secondary crop. All this is possible in such a northerly position because the Shonai Plain is sheltered by a ring of mountains. Fruit is widely grown. In the south, mandarins (2 million tons) are especially important on Honshu and in southern Honshu, the Tsugaru plain is noted for its apples, being wrapped in a paper bag to protect it from june bugs. Grapes and cherries in the north and peaches in the south. Persimmons, pears, plums, and persimmons in many areas. The breeding of silkworms is an ancient and widespread industry, the Borneo area being the most important, but the output has declined owing to the competition of rayon and man-made fibres. The mulberry trees have been replaced by cotton and dairy pastures.

Other main crops are cotton in the south, and tobacco. Potatoes and barley are widely grown in the north and sweet potatoes in the south. Field cropping is limited, but it could probably be greatly extended, especially on the northern island of Hokkaido. At present there are 1.6 million head of cattle; 1 million sheep; 3.7 million pigs. Since the Second World War, the number of beef cattle has doubled and that of



Top: UZBEK SOVIET SOCIALIST REPUBLIC. WEIGHING BALLS OF COTTON. (Society for Cultural Relations with the U.S.S.R.)

Bottom: KAZAKH SOVIET SOCIALIST REPUBLIC. THE THEATRE OF OPERA AND BALLET AT ALMA-ATA. (Society for Cultural Relations with the U.S.S.R.)



Above: U.S.S.R. LUMBER INDUSTRY. A RAFT OF 100,000 CUBIC FEET OF TIMBER BEING TOWED DOWN THE RIVER YENISEI TO THE PORT OF IGARKA. (Society for Cultural Relations with the U.S.S.R.)

Below: U.S.S.R. NOVOSIBIRSK TECHNICAL COLLEGE. STUDENTS AT PRACTICAL WORK IN THE FUR-DRESSING ROOM. (Society for Cultural Relations with the U.S.S.R.)

SILK PRODUCTION AND MULBERRY TREES

	MULBERRY ACREAGE (1,000 acres)	COCOONS PRODUCED (1,000 tons)	RAW SILK (1,000 tons)	EXPORTS OF RAW SILK (1,000 tons)	PER CENT. OF TOTAL EXPORT BY VALUE
1939	1,770	3,992	130	87	15.5
1961	413	1,153	56	13	1.1

By 1964 the output of raw silk had further declined to 20,000 tons, the export to 5,000 tons and by 1966 there was a net import of raw silk.

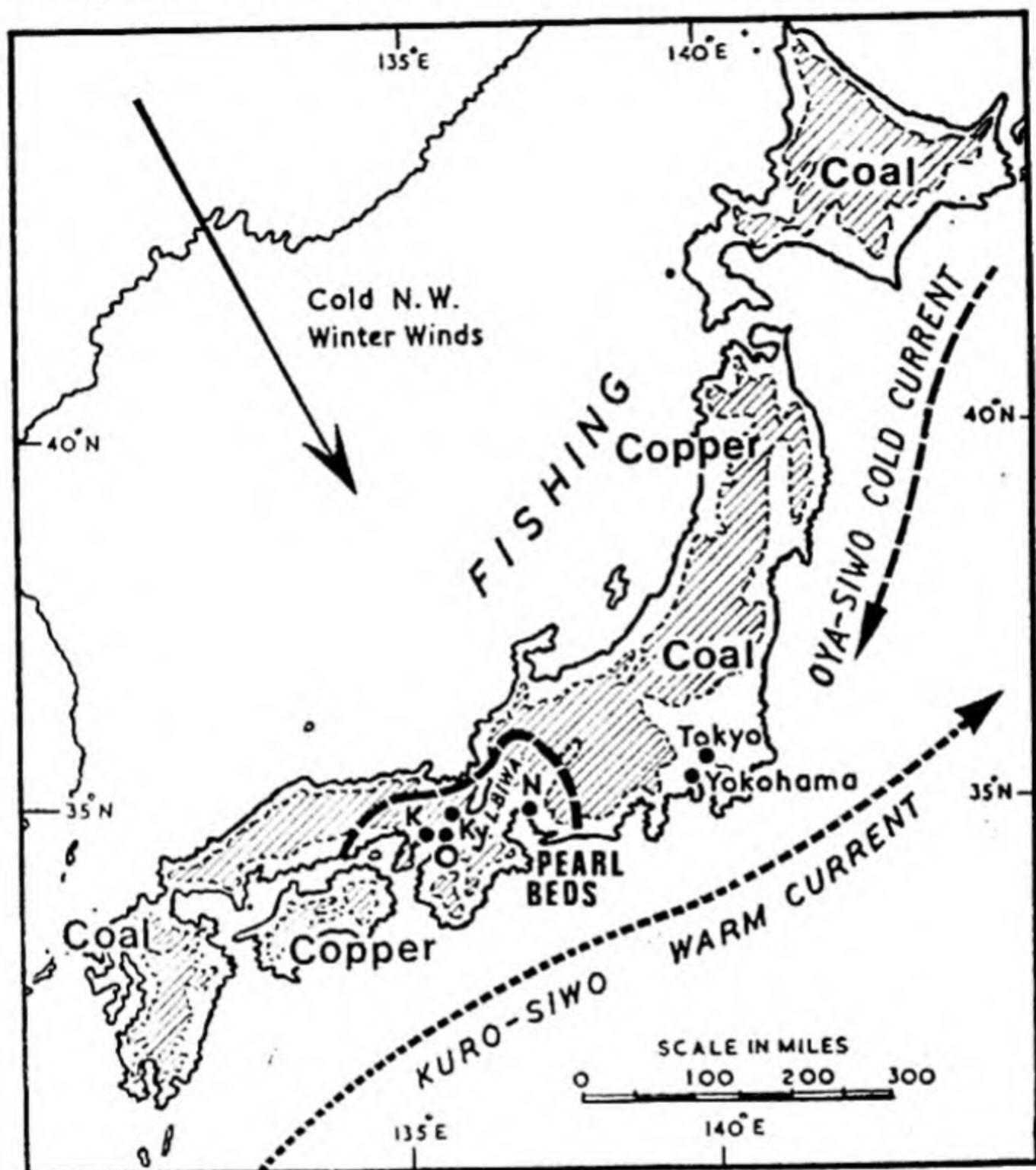
dairy cattle increased sixfold. Agriculture in Japan is on modern lines, having been largely mechanised, and yields per acre are high. Farmworkers have decreased from 37 to 27 million from 1955 to 1971 because younger people have gone to the factories. The bulk of the work is now done by housewives and the older people.

Fisheries

Japan is the second fishing country in the world, its total catch amounting to over $8\frac{1}{2}$ million tons. Its surrounding seas are particularly favourable fishing-grounds, owing to the summer South-East Monsoon blowing over the cold Oya Siwo current, causing fogs (cf. Grand Banks). This is fortunate, because the Japanese rely greatly upon fish for their food because of the small cultivable area. They eat three times as much fish as the British. In addition, fish products form an important part of Japan's export trade (about 6 per cent.). Most of the Japanese fishermen make their catches in home waters, but pollution by effluents from factories and other sources is having a serious effect on the catches. The remainder range as far as the Kuriles to the north-east for salmon and crab; all tropical seas for tuna; the Arafura Sea in the south Pacific for pearls. Most of the salmon and crab are canned for export. The most important home fisheries are off Hokkaido and in the Sea of Japan. The main catches are of herrings, sardines, mackerel, cod, smelt, sauries, and skipjack, as well as pollack for fertilisers (1 million tons).

Aqua-culture (the culture of marine products) is important in many bays. There are 12,000 acres of oyster-beds where oysters are suspended in containers so that they shall not be harmed by water pollution or by their natural enemies. The largest production is off the Kii peninsula. Pearls are formed by oysters to protect themselves from grit which sometimes

penetrate between the shell and soft flesh of the oyster. They are really only thickenings of the smooth inner lining of the oyster shell known as mother-of-pearl. If grit could be inserted the oysters would be forced to make pearls. The annual production of pearls averages 70,000 lbs. In addition,



 Land over 1500 feet.

Fig. 40. JAPAN.

3,000 tons of oysters and baby oysters are exported. There are also extensive areas of edible seaweed cultivation, e.g. in Tokyo Bay.

Minerals

Japan's lack of mineral wealth is a handicap to her industrial development. There are three coal-fields, the most important

one being on Hokkaido, and the others on Kyushu, and to the north-east of Tokyo. The total output is about 40 million tons. Much coal is sent by sea to the Osaka-Kobe industrial belt. There is a relatively small oil-field near Akita (Honshu), but Japan has to import most of its requirements from the Persian Gulf and Indonesia—one reason for its pre-war desire to incorporate the latter in the empire. Japan is self-sufficient in copper, cadmium, lead, zinc, arsenic, bismuth, sulphur, limestone, and gypsum, but it has to import most of its iron from India, Malaya, and the Philippines as well as a great amount of scrap iron.

Manufactures

Industrialisation has developed along two lines—on the one hand the modernisation of ancient existing industries preserving their essentially Japanese character, and on the other the adoption of new industries copied from the western world. Of the former we may cite the pottery, silk, and toy-making industries. Much of the pottery is still made by hand with considerable skill and artistry. But there is also a large output of mass-produced inferior imitations. There is an increasing manufacture of bone china. The famous egg-shell type is made on Honshu, whilst the coarser, embossed and enamelled Satsuma ware comes from Kyushu.

Silk has been produced since the 7th century, mainly for the richer classes. Until the 15th century, when cotton was introduced the masses wore cloth made from hemp and flax. Although Japan is still the world's largest exporter of silk, this now holds a minor place in the list of Japanese exports. Rice paper has long been produced and is used in the making of sliding doors, a feature of Japanese homes, and of oiled paper umbrellas. The Japanese are expert at toy-making as well as lacquer work. There are many small-scale industries in all parts of Japan. Let us take, as an example, the isolated north-west corner of Honshu. At Akita, lengths of kimono silk, dyed with vegetable dyes, and silver filigree work are produced. At Yonezawa there is a considerable silk industry, there being over 400 mills, each employing a small number of workers. Tendo and Tsuruoka make beautifully carved chess-men, and the latter also produces lacquered cigarette boxes, agricultural implements, and badminton rackets, the

last being for export. At Morioka there is a large output of iron kettles. All these industries are carried on in a similar way to those in England before the Industrial Revolution, for this is an area isolated by mountains and with poor communications. The only important development has been copper mining and oil-drilling in the neighbourhood of Akita.

Japan is the largest Asiatic producer of steel and third world producer. It produces 58 million tons of pig-iron, 98 million tons of crude steel, and 16 million tons of rolled steel. There is no coking coal, so this has to be imported from the U.S.A., Australia, and Vietnam.

The chief modern industries are situated in the areas Tokyo-Yokohama, Kobe-Kyoto, Osaka, Nagoya, and North Kyushu. Here are the highest mountains and the swiftest streams. Hydro-electric power was first generated on a small scale from the natural reservoir of Lake Biwa, but now barrages on the rivers Kiso, Tenryu, and others in central Honshu, are far greater sources of supply. Japan's hydro-electric resources are now well developed, and attention is being paid to nuclear energy. In these modern industries the Japanese went to great pains to copy their rivals' products, even to the length of imitating their trade marks. Because of the very cheap labour they were able to capture much of the world market, especially in the cheaper types of goods. Realising the bad reputation that this had given to Japanese goods, the Government has appointed a commission whose task it is to prevent these close imitations. By 1970 average wages were equal to those in Italy and not far short of those in Britain.

An important industry is that of cotton spinning and weaving. Lancashire felt the competition very much in the market for cotton cloth in the Far East. Indeed, Japan had ousted her from first place as exporter of cotton lengths. Apart from their lower wages the Japanese operatives worked longer and attended to 12 to 16 looms each as compared with the 6 and 8 looms of our own weavers. Offsetting this, the quality of the goods produced was much inferior, so that we retained the market in high quality cottons, but Japan is now competing in this market also. Production is declining because Japan's customers are making more of their own cotton goods and the home market is using more man-made fibres. The raw cotton is imported from the U.S.A. and India. There

is also a large woollen industry, the raw wool being imported from Australia, U.S.A., U.S.S.R., and Canada. Japan's soft-wood forests which cover 62 million acres (mainly cedar, pine, and cypress), are a valuable asset and led to her becoming the chief world exporter of rayon. By 1960, output of rayon and other man-made fibres had risen to 433,000 tons and by 1970 to over 1 million tons.

Ship-building developed rapidly as Japan built up her naval and mercantile fleets. The latter at 27 million tons ranked as the second largest in the world. In 1956 the United Kingdom was ousted from first position as a ship-building nation by Japan, when the tonnage completed amounted to 1,750,000 tons, double that of 1955. In 1970 the shipping launched amounted to 7 million tons. The chief types of ships being built are oil-tankers, container-ships, and iron-ore carriers. The principal centres are Hiroshima, Kure, Nagasaki, Sasebo, Innoshima Island, Kobe, and Yokosuka.

Other industries are the manufacture of pencils, matches, whisky, glass, paints, synthetic rubber (23,000 tons—second in the world), and cycles. The Japanese use the last-named widely, and there is a large export market, *e.g.* to Africa. Cement making is expanding, the annual output now being over 36½ million tons. Prior to 1953, light industries predominated. Since then heavy industry has taken first place, especially the manufacture of machinery (including electric and textile), rolling stock, and road vehicles. There has been a phenomenal growth in the last-named, especially in cars and motor-cycles. The chemical industry has also developed greatly, despite the fact that much of the raw materials has to be imported. The chief products are sulphuric acid (7 million tons), ammonium sulphate (2·3 million tons), superphosphate, soap, fertilisers, and dyestuffs. The aluminium, rubber, and aircraft industries are also important. Other products include plastics, watches and clocks, sewing machines, cash registers, adding machines, typewriters, cameras (first in the world), radio and television sets (second in the world), computers, machine tools, and a wide variety of household appliances, such as washing machines, refrigerators, and vacuum cleaners—all of good quality and all on the export list. Japan produces over 8 million tons of paper and cardboard (second

in world), and has a very large printing and bookbinding industry.

After the Second World War America assumed for some years a large measure of control over Japan, resulting in the democratisation of the country as shown by the changed status of the Emperor, now a constitutional monarch rather than a deity. The Americans encouraged the re-establishment of Japanese industries and of the export trade because they did not wish Japan to become a charge similar to that of Western Germany. One other result of American occupation has been the improvement of the lot of the workers by higher wages and shorter hours. The average wage has more than quadrupled since 1947. This affected world trade by bringing the cost of Japanese goods nearer to that of the West. Indeed, the nearer the standard of living of all Asiatics is brought to that of the peoples of Europe and U.S.A., the more the latter will benefit by expanding markets. Some idea of the improved standards that have already been attained is indicated by the fact that there is now a washing machine to every three households and a television set to every two.

Population and Towns

The population of Japan in 1970 was 105 million, giving a density of 700 to the square mile, or, more realistically, 4,750 per square mile of cultivated land, compared with 1,796 in the United Kingdom. The annual increase is over 1 million, and 72 per cent. of the people live in cities. When one realises that only 15 per cent. of the land area is cultivable, and that a quarter of the food and three-quarters of the raw materials have to be imported, it is obvious how vital it is, as in the case of Britain, that manufacturing industries should flourish and be able to export large quantities of goods.

Tokyo (11,403,744), the capital, now the largest city in the world, is situated on the most important island in a central position on its eastern coast—the more important one. It is on the largest lowland in the country and has a good harbour—an essential for a capital of an insular country where much of its passenger traffic was originally by sea. A large area of Tokyo Bay has been reclaimed by tipping "iron-rock"

(compressed garbage) to house the rapidly expanding population. It has iron and steel, electrical and other machinery, food processing, chemical, railway engineering, brewing, and printing and publishing industries. Its out-port, Yokohama (2,300,000), is on the south-western shore of the bay in a sheltered position and having deep enough water to take very large vessels. It has ship-building, engineering, and chemical industries.

Shizuoka (370,000), situated near the western shore of the next bay to the west, is the chief tea-market of Japan. It is at the confluence of two streams which drain a plantation area. After a belt of mountainous country comes another large inlet, Ise Wan, at the head of which stands Nagoya (2,000,000), the fourth city of Japan. It is a centre of routes and market town for a fairly large plain. It has light industries, motor engineering, metallurgical, woollen, textile, and chemical works. To the north-east, the satellite town of Seto (80,000) makes toys and pottery; to the north-west Ichinomiya (150,000) has a woollen industry. Toyota manufactures cars.

After another mountainous belt there is yet another large inlet, the bottle-necked Osaka Wan, on whose northern shores stand Osaka (2,900,000), the "Manchester" and second city of Japan, and Kobe (1,300,000), its second port. Osaka not only has a great cotton industry, but also ship-building, steel, and chemical works. Kobe imports raw cotton and exports textiles. The importance of the Osaka-Kobe area is evident from the fact that it produces 20 per cent. of Japan's manufactured goods and 40 per cent. of its exports. To the north-west of Osaka, the valley of the Yodo River leads to Kyoto (1,400,000), the former capital of Japan, which stands very near the southern end of Lake Biwa. It is an important centre of the silk industry.

In 1963 the five cities of the north-east of Kyushu: Yawata (steel), Wakamatsu (coal), Kokura (textiles), Tobata (machinery), and Moji were formed into one large combination, the city of Kita-Kyushu with very important iron and steel industries and a population of over a million. Fukuoka (650,000) situated on an inlet on the north coast has engineering industries. Not far to the east, Wakamatsu (97,000) has large steel works. On the west, Nagasaki is near a coal-field and has

iron, steel, and shipbuilding industries. The capital of Hokkaido—Sapporo (1,000,000)—stands on a plain which extends from the north-east to the south. By re-settling people from the overcrowded areas of Honshu, the island's population should increase to some 10 million. Muroran, on the south-west coast, exports coal.

Over 90 per cent. of Japan's exports are manufactured articles and nearly 60 per cent. of her imports are raw materials and fuel needed for their manufacture. Most of the rest of the imports consists of food. A summary of Japanese trade is given below, and the student should compare these with the corresponding figures for the United Kingdom (see *Modern Geography, British Isles*, pp. 243-4).

SUMMARY OF TRADE 1969

	IMPORTS (£m.)	EXPORTS (£m.)
Foodstuffs ..	641	148
Raw Materials ..	1,526	92
Fuel ..	722	12
Manufactures ..	857	3,619

Nearly one-third of Japan's imports come from the United States. The other principal suppliers are Australia, Canada, Malaya, and Mexico. The United States takes about one-third of Japan's exports and Australia, Liberia, Hong Kong, India, Malaya, and China are other large customers.

To the south-west of Kyushu are the Okinawa group, the largest having an area of 454 square miles, the chief products are cane-sugar and pineapples. The capital is Naha (258,000).

TRADE OF JAPAN 1969

PRINCIPAL IMPORTS (in £ millions)				PRINCIPAL EXPORTS (in £ millions)			
Wheat ..	..	..	297	Fish ..	..	..	273
Soya Beans ..	..	..	281	Pottery ..	..	..	137
Wood ..	..	..	1,275	Iron and Steel ..	..	..	2,200
Cotton ..	..	..	414	Textile machinery ..	..	..	148
Iron Ore ..	..	..	968	Sewing machines ..	..	..	116
Copper ..	..	..	341	Radios and TV. sets ..	..	..	580
Coal ..	..	..	675	Buses and Trucks ..	..	..	308
Petroleum ..	..	..	1,907	Ships ..	..	..	1,000
Chemicals ..	..	..	283	Clothing ..	..	..	451
Copper alloys ..	..	..	508	Optical Instruments ..	..	..	439
Office machinery ..	..	..	257	Toys ..	..	..	130

N.B. Japan is now a net importer of cotton goods especially from Pakistan.

CHAPTER XVIII

THE UNION OF SOVIET SOCIALIST REPUBLICS

As stated in Chapter XX of Book III in this series, the U.S.S.R. is now one vast area extending from the boundaries of Poland, Hungary, and Roumania in the west, to the Pacific in the east. The Ural Mountains form no real barrier, so that this expansion of Russian political power from Europe into Asia was but natural. In many ways, the Russian mentality is Asiatic rather than European in character, although the initiative and progressive outlook have come from the European part, having been absorbed from western neighbours.

Physically, U.S.S.R. may be divided into (1) the Western Plain, which extends from the European section to the River Yenisei; (2) North-Eastern Siberia, a plateau of ancient rock extending to the Bering Sea; (3) the South-Western Plain, extending roughly south of lat. 50° and being mainly the drainage area of the Aral Sea; (4) the South-Eastern Highland Fringe, which includes the Pamir region.

Climatic Regions

Apart from the eastern coastal belt the whole of this area slopes northwards, so that the two main climatic controls are exposure to the Arctic and the screening effect of the Central Asiatic Highland Belt, with the result that over the whole of the area the winters are bitterly cold and the precipitation is moderate to light. Along the Pacific coast there is a cold current (the Kamchatka), so that winter conditions are no better. Indeed, in a way they are worse because, although the temperatures are not so low as in some parts of the interior, the air is moist.

Naturally, over such a vast area conditions vary greatly and it will be necessary to divide it into several climatic sub-divisions. Extending along the northern coast as far inland as the 10° C. (50° F.) July isotherm (the northern limit of tree-growth) there is the *Tundra*. Note how this region penetrates farthest to the south to round the head of the great estuary of the Ob which has a similar effect, though on a smaller scale, to that of Hudson Bay in North America. Throughout the tundra the winters are very cold and the cold becomes more

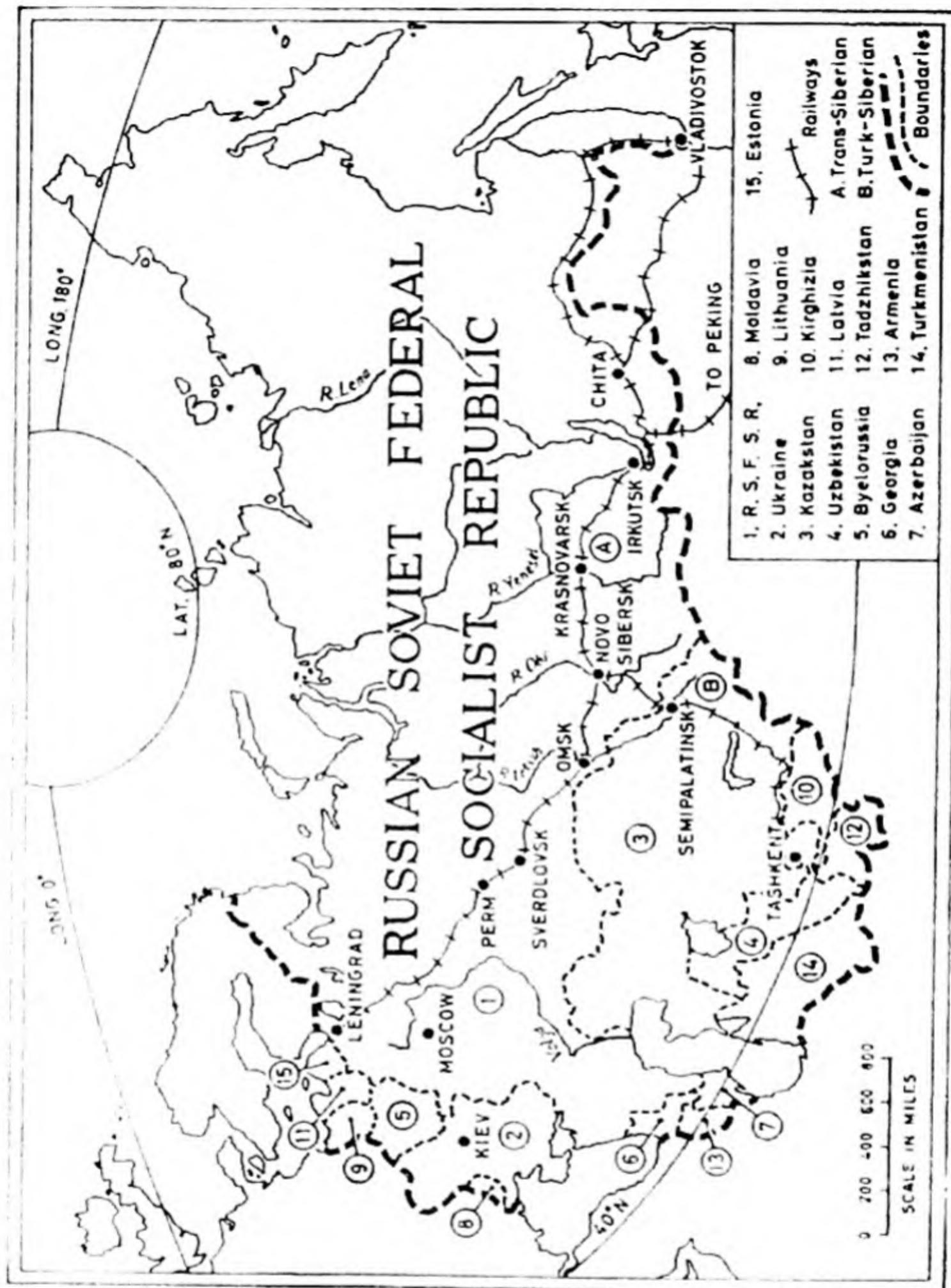


Fig. 41. U.S.S.R. POLITICAL DIVISIONS AND THE TRANS-SIBERIAN RAILWAY.

intense progressively eastwards, until near the mouth of the Lena River the January temperature averages -36° C. (-40° F.). The rainfall is moderate and also decreases eastwards. It is everywhere less than 10 in. and most of this falls in summer in the form of drizzle. Owing to the long hours of sunshine in the Arctic, summer temperatures in sheltered valleys often rise to over 21° C. (70° F.). In winter there is

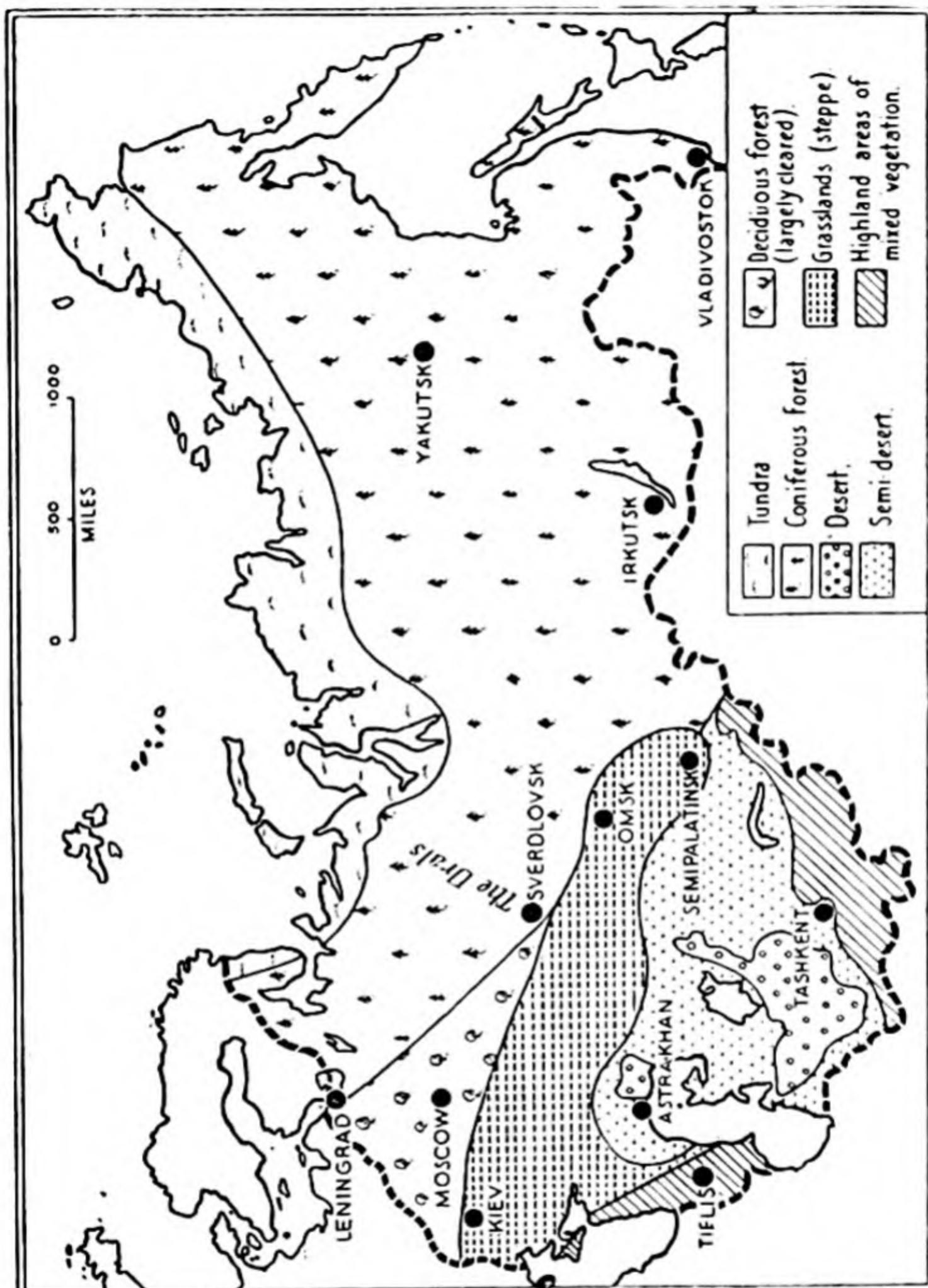


Fig. 42. NATURAL VEGETATION OF THE U.S.S.R.

a light snowfall which accumulates during the cold season and so by the end of winter appears to be more considerable than it really is.

South of the 10° C. (50° F.) July isotherm and widening considerably towards the east there is a belt of *coniferous forest*. Over the whole of this belt the summer temperatures are in the 16° - 21° C. (60° - 70° F.) range, but the midwinter tempera-

tures vary greatly, there being a steady decrease from west to east—Tobolsk, -19° C. (-2° F.); Yakutsk, -44° C. (-46° F.); Verkhoyansk, -51° C. (-60° F.). There is a similar decrease in average annual rainfall towards the east (Tobolsk, 18 in.; Yakutsk, 14 in.). There is a pronounced summer maximum rainfall which also becomes more marked as one travels eastwards (Tobolsk, 72 per cent.; Yakutsk, 79 per cent.).

The Far Eastern Belt is, of course, somewhat modified by Pacific influences, but these are not so strong as might be supposed because (a) in winter the winds are off-shore, and (b) the cold Kamchatka current neutralises the usual warming effect of the ocean. In summer winds are on-shore and so the maximum rainfall occurs at that season (Vladivostok, 80 per cent.).

The Steppe Land of the south-west has uniformly high midsummer average temperatures, *i.e.* about 21° C. (70° F.), and the winters are cold. Here again there is a decrease towards the east. Most of the rain falls in summer in the form of convectional summer storms.

To the south of the steppes there is the semi-desert *Turan* region where there are very high summer temperatures, *i.e.* 27° C. (80° F.) and the winters are still cold but above zero. The rainfall is a very small one (2 in.-5 in.).

Under the Tsars there had been very little development in the Asiatic territories, for they had been regarded mainly as a colonial possession and a convenient dumping ground for political prisoners. Although the latter are still sent there to work in the forests and mines, much progress has been made under the Soviets in the encouragement of agriculture, forestry, mining, and manufactures. A great deal of the work has been undertaken by the inhabitants of the various localities, so that a tremendous social revolution has taken place. Thus, the erstwhile reindeer-rearing Samoyeds and Yakuts of the tundra have started to rear cattle and to work in such new ports as Igarka on the Yenisei, and the once nomadic Uzbeks now cultivate great areas of cotton and other crops and work in factories.

Politically, all but the south-western areas come under the great Russian Soviet Federal Socialist Republic, which is sub-

divided into provinces and regions for the purposes of local government. In the south-west there is a group of smaller autonomous Soviet Republics based upon local racial groups. They are in the Kazakh S.S.R., the Turkmen S.S.R., the Kirghiz S.S.R., the Tadzhik S.S.R., and the Uzbek S.S.R.

The R.S.F.S.R. (Asiatic Territories)

This vast territory extends from the Ural Mountains to the Pacific Ocean and may be sub-divided into the following economic areas:—

(1) The Tundra, (2) the Coniferous Forests, (3) a relatively small portion of the steppes in the south-west, (4) the Central Asiatic Highland Belt, and (5) the Far Eastern Region.

1. **THE TUNDRA.** Some attention has been paid by Soviet agricultural scientists to this narrow belt bordering the Arctic. Climatically it suffers from very cold winters, the intensity of the cold increasing eastwards, but the summers are quite warm and there is almost continuous daylight. The soil is poor in humus and near the rivers it remains frozen. However, on the higher ground, in pockets where soil has collected since the original was removed by the glaciers during the Ice Age, experimental crops of perennial wheat have been grown and, where new ports have been founded, *e.g.* Igarka, the cultivation of vegetables has proved successful. Some of the nomadic tribes have been encouraged to grow grass to feed cattle, but on the whole most of them, especially the Chukches of the east, still pursue their accustomed occupations, rearing reindeer, fishing, trapping, and collecting berries during the summer.

Along the Arctic shore the ice closes in during the winter but for a while in summer a narrow lane is cleared. Soviet steamers then make use of this to reach various ports which have sprung up in or near the tundra to handle the produce of the interior, especially timber from the coniferous forests. Chief of these is Igarka which is over 400 miles up the Yenisei River at a point where it is five miles wide. The building of the town was commenced in 1928 and serious difficulties were surmounted by novel methods. Thus to provide a water supply heated pipes had to be laid alongside the mains to prevent freezing. The construction of a safe harbour in such a deep river also presented problems, but the engineers waited

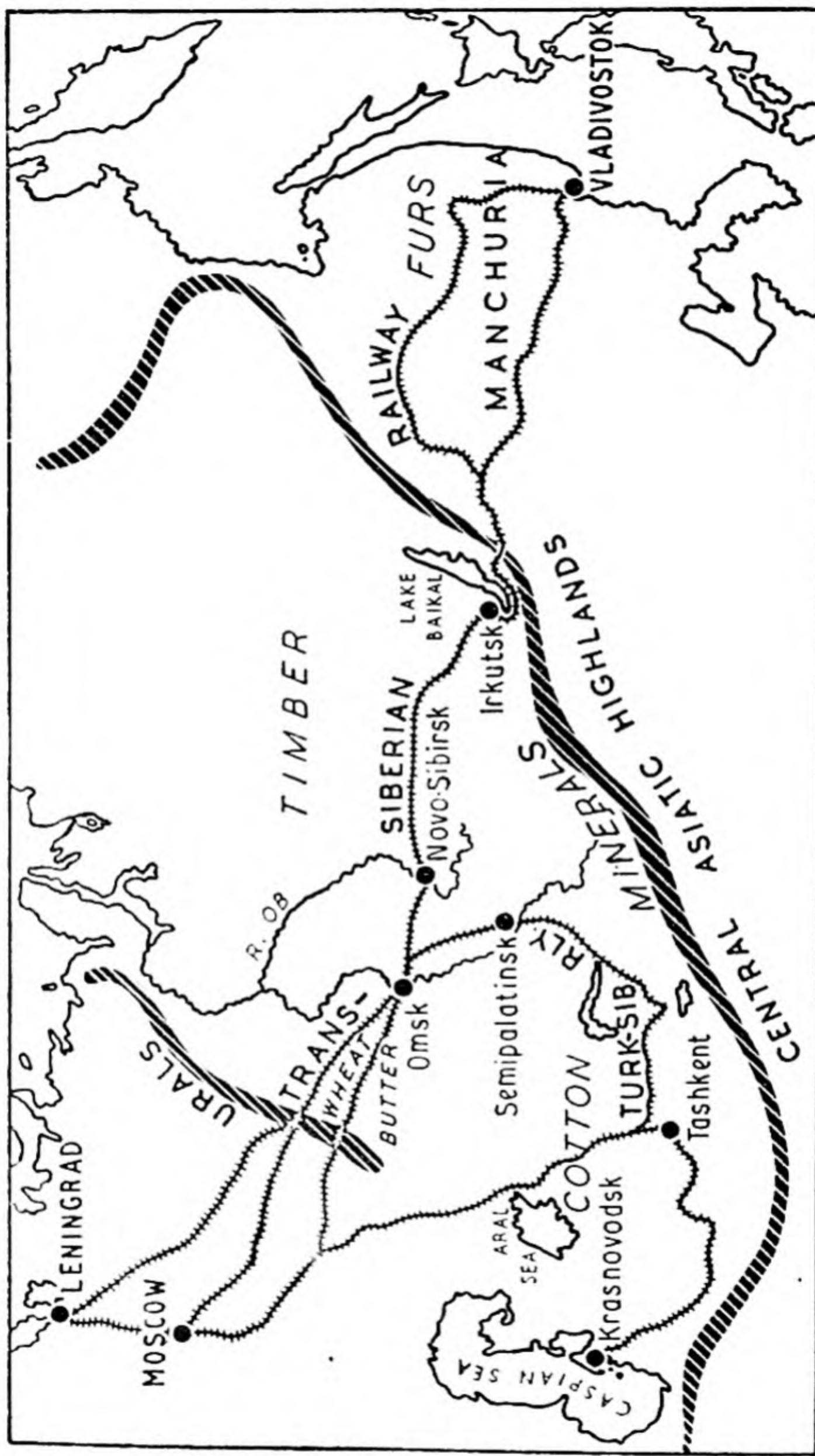


Fig. 43. TRANS-SIBERIAN AND "TURK-SIB" RAILWAYS.

until the river was at its lowest in midwinter when, at a temperature of -36° C. (-40° F.), the surface ice was mined and after the bed had been pierced by steam needles, piles were driven into it to a depth of 25 ft. Even then the tremendous variation in the depth of the river makes things difficult. The quay is covered by about 45 ft. of water in June, but is so strongly built that it is ready for use when it reappears in July. Food supplies provided another difficulty, but vegetables are grown in hothouses which have blinds drawn during part of the Arctic summer "day". Another method is to partly germinate seeds before planting, which gives them sufficient start. Incidentally, on isolated Arctic islands where mainly only meteorologists are stationed, underground hothouses are used. One of the chief reasons for the slowness of the exploitation of the Siberian forests has been the poor communications, and the great rivers provide a means of getting over the difficulty. As it is, in autumn the ships sometimes get caught by the ice and the crews have to be rescued by Soviet planes.

2. THE CONIFEROUS FORESTS. These cover a vast area extending from the Pacific Ocean to the Urals. They may be divided into two main regions: the lands west of the Yenisei corresponding with the belt of more recent rocks, and those to the eastwards, coinciding with the ancient plateau. The former region consists of a high proportion of marshland, and flooding is frequent. In the spring the lower courses of the Ob and its tributaries remain frozen, whereas there is a thaw in the southern parts of the basin. Again, in the autumn, the frost comes to the lower portion first, so that at both seasons flooding results.

In the forests there are enormous reserves of timber suitable for building, for paper, and for rayon, but poor communications have hitherto prevented systematic exploitation. It was to reach this timber that shipping routes have been opened along the Arctic and that such ports as Igarka have been founded. For a long time much of the labour has been provided by political and criminal prisoners. Much of the timber in the western lowland is valueless as it has rotted in the marshes.

The area east of the Yenisei, which is divided between the East Siberian region and the Yakutsk Autonomous Soviet

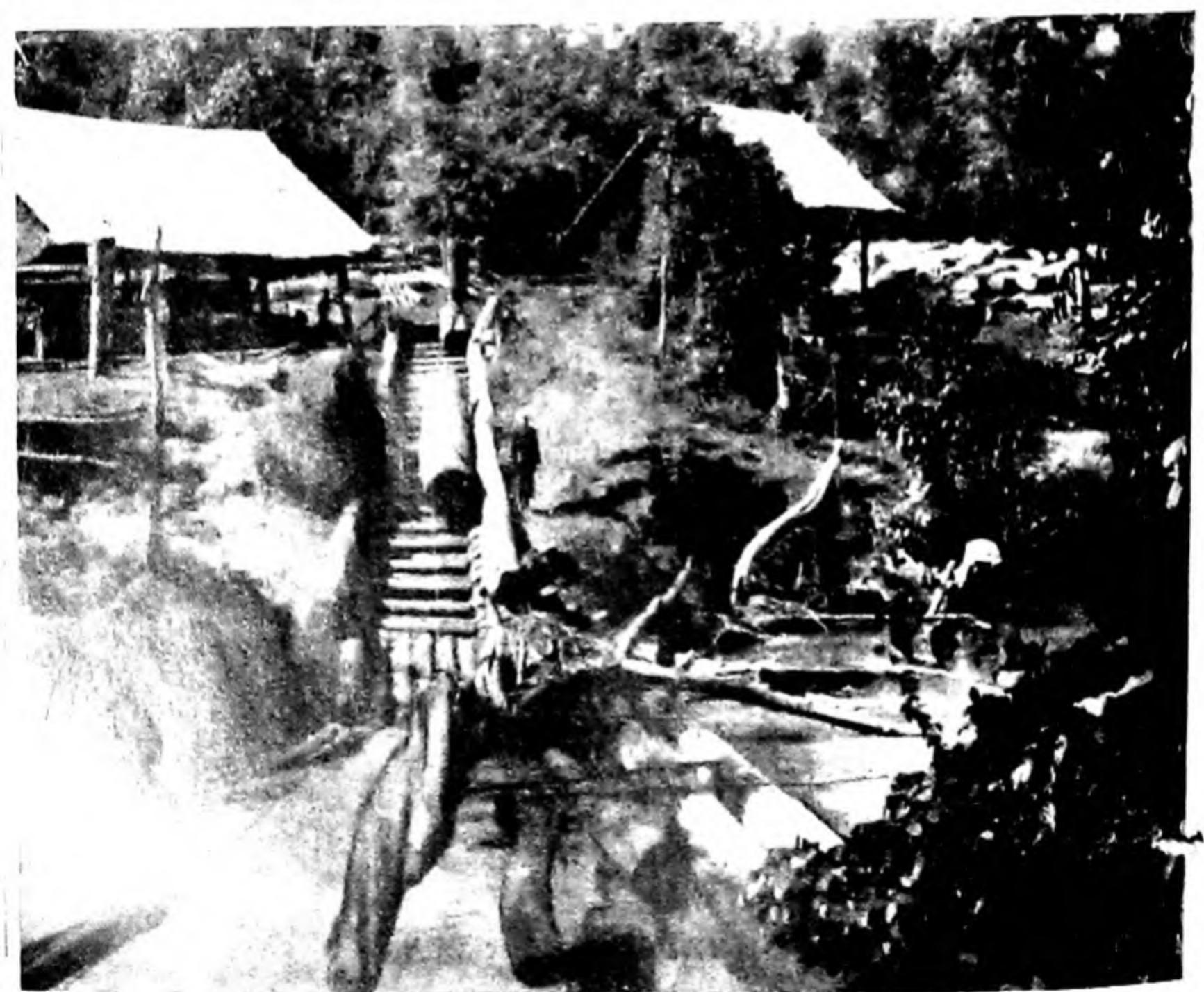
Socialist Republic, shows great promise as a mineral bearing area. Geologically it is very similar to the Canadian Shield. Already there are important goldfields in the Lena Basin, which are responsible for the greater part of the Russian output, now second only to that of the Union of South Africa. The air service between Yakutsk and Irkutsk has greatly facilitated the development of this goldfield but the primary need is for railways. A line from the Lena River at Nat-Kut to the Angara River at Zayarsk has been opened and will link the Lena Basin with the Trans-Siberian Railway. Motor roads link outlying districts with the existing lines, e.g. the gold mining centre at Aldan. Other minerals are silver, lead, salt, and coal. There are vast reserves of the last-named on the Lower Yenisei (Tunguz field) and Lower Lena (Yakut field). It is known, too, that there are great areas of copper-bearing rock. The only industries are sawmilling, paper, and cellulose works at Igarka and Krasnoyarsk (1939, 190,000; 1963, 480,000). At the latter a huge dam has been constructed across the Yenisei to generate 4 million kW. and is claimed to be the largest in the world. Part of this electricity is used by the aluminium industry which has an output of 30,000 tons. At Bratsk, on the Upper Tunguska (Angara) River some 350 miles to the east of Krasnoyarsk, another huge dam 300 ft. in height has been built. Here 3,600,000 kW. will be generated.

In 1954 a diamond field was found in Yakutsk, claimed to be as rich as that in South Africa. As U.S.S.R. has had to rely upon imports for most of its industrial diamonds the exploitation of these new fields is being carried out as rapidly as possible despite the handicap of poor communications. Alluvial diamonds are being dredged along the Vilyny River, the chief left-bank tributary of the Lena, and the pipes from which these have been eroded have been discovered in the upper basins of the Vilyny's tributaries and in the basin of the Plenek River some distance to the north. The richest pipe, however, is to the south of the Vilyny at Misny, and a road has been made to link this with the river port of Mukhtuya on the Lena. Diamonds from the rich alluvial deposits at Noryi not far away are also being transported by the same route.



Above: CYLTON. A COCONUT ESTATE. *Inset*: Part of the Estate.

Below: CYLTON. EXPENSIVE RUBBER TREES. *Inset*: A Natives' Village.



BURMA TEAK INDUSTRY

190. ELEPHANTS SWIMMING LOGS. (See page 116.)

(See page 116.)

In the forests, especially of Yakutsk, hunting and trapping of fur-bearing animals are important, many valuable pelts being exported. Agriculture is not well developed in the eastern regions but in Western Siberia there has been a great deal of marsh draining. Rich meadow grasses feed large herds of dairy cattle. Flax, hemp, and wheat are cultivated. In forest clearings the poor humus and lime deficient podzol soils have been limed and treated with fertilisers, so that they now yield fair crops of rye, oats, and vegetables for nearby towns. There is a large new oil-field in the Ob basin.

The towns in the forest are either older settlements along the Trans-Siberian Railway like Omsk, with an electrical precision instruments industry, Tomsk (1939, 145,000; 1963, 282,000) or Krasnoyarsk, bridge town on the Upper Yenisei, or they are lumbering centres like Yeniseisk, a river port near the confluence of the Yenisei and the Upper Tunguska. Regional capitals are Novosibirsk (1939, 404,000; 1967, 1,064,000), and Yakutsk.

3. THE SOUTH-WESTERN STEPPE. This is a relatively narrow belt extending from the Southern Urals to the neighbourhood of Barnaul. It is not the open grassland usually associated with the term "steppe" but it is very similar to the "grove belt" which divides the Canadian prairie from the coniferous forests. It is a park land country with large areas of grass interspersed with trees. Here the fertile soils yield rich crops of wheat, barley, millet, and sugar-beet. It is the second most important wheat-growing region in the whole of the Soviets, yielding about 13 per cent. of the crop, and is really a continuation of the Ukrainian black earth or "chernozem" soil. It is a mixture of humus (decayed vegetable matter), loess (wind borne from the semi-deserts of Central Asia), and alluvium. The blackness has been caused by the annual decay of grass. In West Siberia the farming is largely carried out on Sovkhozes, or large State-run farms, as distinct from the collective farms of the Ukraine, where the workers manage their own affairs. The reason for the difference is that whereas in the Ukraine cultivation of the soil is a well-established industry, in Siberia many of the people are unaccustomed to it, having until recently been nomadic pastoralists, so that they need the supervision of

experts. An exception to this is a belt along the track of the Trans-Siberian Railway which, soon after its construction, brought colonists from European Russia. It is on this line that the chief towns are situated. They include Omsk (675,000) at the crossing of the Irtysh, chief tributary of the Ob, an engineering centre. Barnaul (360,000), bridge town on the Ob, is an important junction on the "Turk-Sib" Railway.

A great industrial belt has arisen along the south-eastern flank of the Ural Mountains. It forms half of the comple-

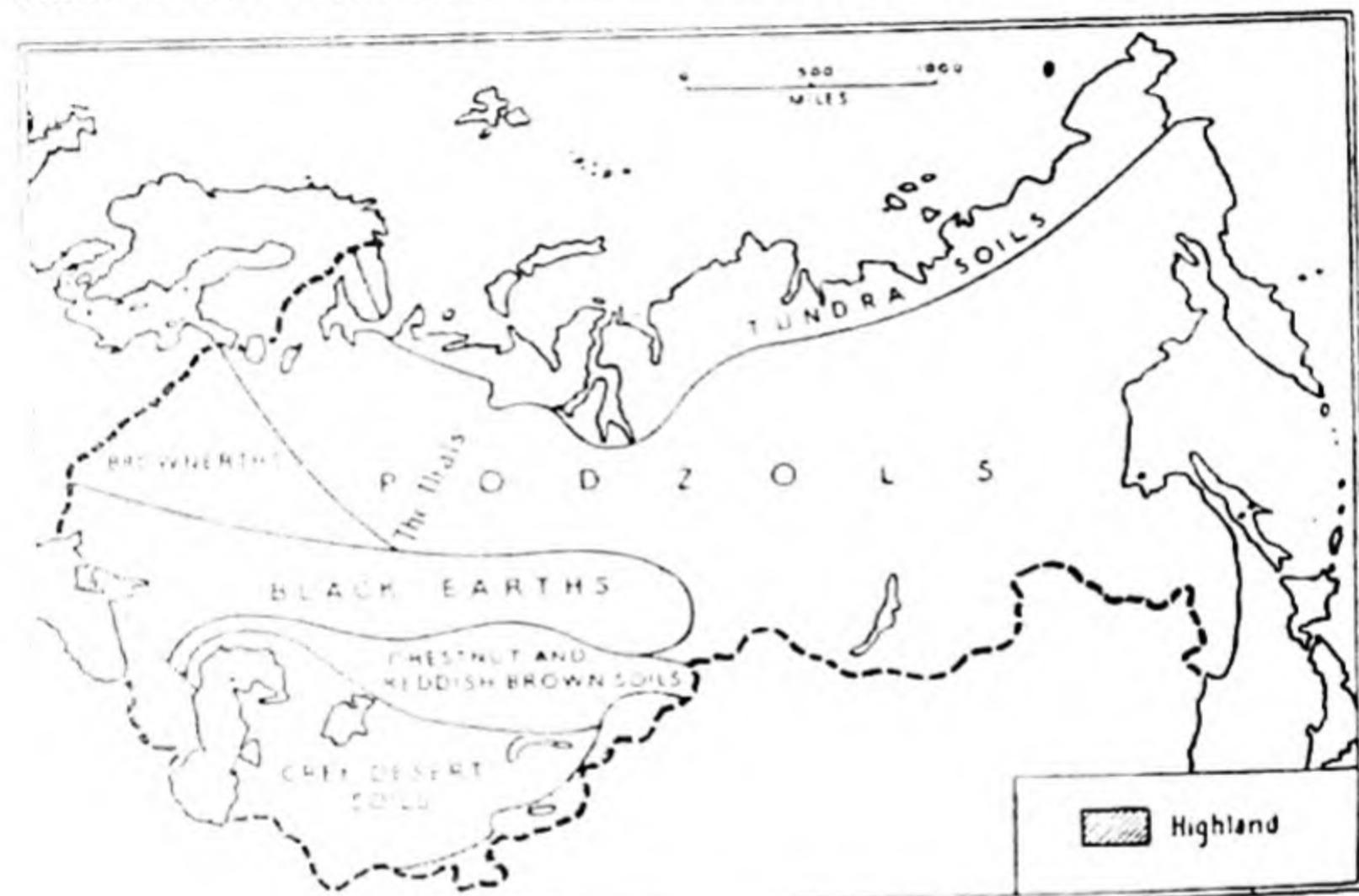


Fig. 44. THE MAJOR SOIL ZONES OF THE U.S.S.R.

mentary Urals-Kuznetsk Combine, the former sending iron-ore to the latter in exchange for its good coking coals. It also obtains coal from the Karaganda field in Khazakh S.S. At Magnitogorsk (311,000) there are great furnaces and rolling mills as well as aero engine and aluminium industries.

4. THE CENTRAL ASIATIC HIGHLANDS extend from the Kazakh boundary eastwards and are the northern edge of the great mass of highlands which form the heartland of Asia, including the Altai and Sayan Mountains as well as Lake Baikal. Over much of the area life remains primitive and pastoral, but even the isolated Buriat Mongolians who live to the south-east of Lake Baikal have been taught the science

of cattle breeding. On the extreme north-west there has developed one of the most important industrial areas of the Soviet Union, the Kuzbas, based on the Kuznetsk coal-field between the Upper Ob and Yenisei. Its development was hastened by the German occupation of the Donbas, and it is now the second largest coal-producing area. Much of the coal is sent to the great metallurgical industries of the Southern Urals, 1,400 miles away, but an increasing tonnage is being retained for the metal industries of Novo-Kuznetsk (population 410,000) developed from the iron mines at Telbes. Railway engineering and the manufacture of heavy machinery are carried on as well as sugar-refining. There is also an important aluminium industry developed during the Second World War. Coal-mining towns are Prokopyevsk (1939, 107,000; 1963, 292,000) and Anjero-Sudjeansk (116,000). Nitrates, nitric acid, and many other valuable chemicals are obtained from the coke-ovens. Not far to the east, in the winding gorge of the Upper Yenisei, is the smaller Minusinsk coal-field, useful to the Trans-Siberian Railway, which in its early days relied for fuel on timber felled from the Siberian forests and stacked in huge piles along the line. After making its way along the northern edge of the highlands the line penetrates them by way of the Upper Tunguska (Angara) Valley, where the outflow from Lake Baikal reaches the Siberian plain. So it arrives at Irkutsk (390,000), where there are silk industries. Here the swift Angara has been dammed to generate 600,000 kW. The power is being used partly to run a section of the railway and also to supply the new aluminium works at Shyelikov, nearer Lake Baikal. A vast expansion of the Angara scheme is being carried out with the damming of the river below its outfall from the lake. The railway then makes its way round the south-western end of the lake by a narrow platform between it and the eastern edge of the Sayan Mountains. In winter, when Lake Baikal is frozen and the platform is impassable, ice-breaker train-ferries carry the trains across the lake.

5. THE FAR EASTERN REGION. With the exception of the area to the extreme south-east, the hinterland of the Pacific coast is about the wildest and least developed part of the

Union. There is a succession of high mountain ranges backing a very inhospitable coast where gales and fogs are frequent and the winters are bitterly cold, partly because of the north-west winds which blow from the land and partly because of the cold Kamchatka currents. The Sea of Okhotsk is full of icebergs and even Vladivostok harbour is frozen, although it is farther south than Marseilles. Much of the interior is unexplored and is densely forested, so that the few settlements are coastal fishing villages. Until the Second World War the Japanese had concessions to fish the rivers for salmon which were canned and exported. It is known that the region is rich in minerals—copper, manganese, iron, etc.

The extreme north-east is inhabited by the backward Chukches, akin to the Eskimo. The Kamchatka Peninsula is sparsely populated by hunters and fishermen and there has been a certain amount of development of an oil-field on Sakhalin Island, formerly shared with Japan but now completely held by U.S.S.R. It is, however, only in the south-east that there has been any real progress. Lumbering and trapping are important there and agriculture (especially market-gardening) and cattle rearing have been commenced in the hinterland of Vladivostok (338,000), one important crop being sugar-beet and another soya beans. This port, once Russia's commercial outlet on the Pacific and terminus of the Trans-Siberian Railway, is now a naval base. A new port, Nakhodka, some miles to the east, has been developed especially for the growing container trade with Niigata in north-west Honshu. Ultimately, this will link the latter with north-west Europe when improvements have been made to the railway. The port is also linked by pipe-line with the new north east Siberian oil and natural gas field at Tyumen, much of the production being destined for Japan. It has important smelting works, shipyards, and cloth-mills. The only other towns of consequence are on the River Amur. They are Khabarovsk (322,000), railway bridge-town at the confluence of the Amur, Ussuri, and Sungari Rivers, and Komsomolsk (190,000), terminus of a branch line and centre of a modern steel industry and oil refineries. Nikolaevsk, at the mouth of the Amur, has shipyards, oil refineries, and food canneries. Coal is obtained from the Burei Valley, and iron imported from the Little Khingan Range in Manchuria.

The South-Western Soviets

In many ways the Soviets of the great south-western plain are the most interesting part of the Union for there has been more rapid progress here than elsewhere. People who were primitive nomads up to a few years ago, following their herds of horses, are now skilled agriculturalists and factory workers. Ancient centres of caravan routes like Tashkent (1,250,000) and Samarkand (224,000) are now industrial cities, whilst new towns like Dyushambe (Stalinabad) (275,000) have arisen in what was recently very sparsely-populated mountain country.

The region is divided amongst several Soviets. Across the

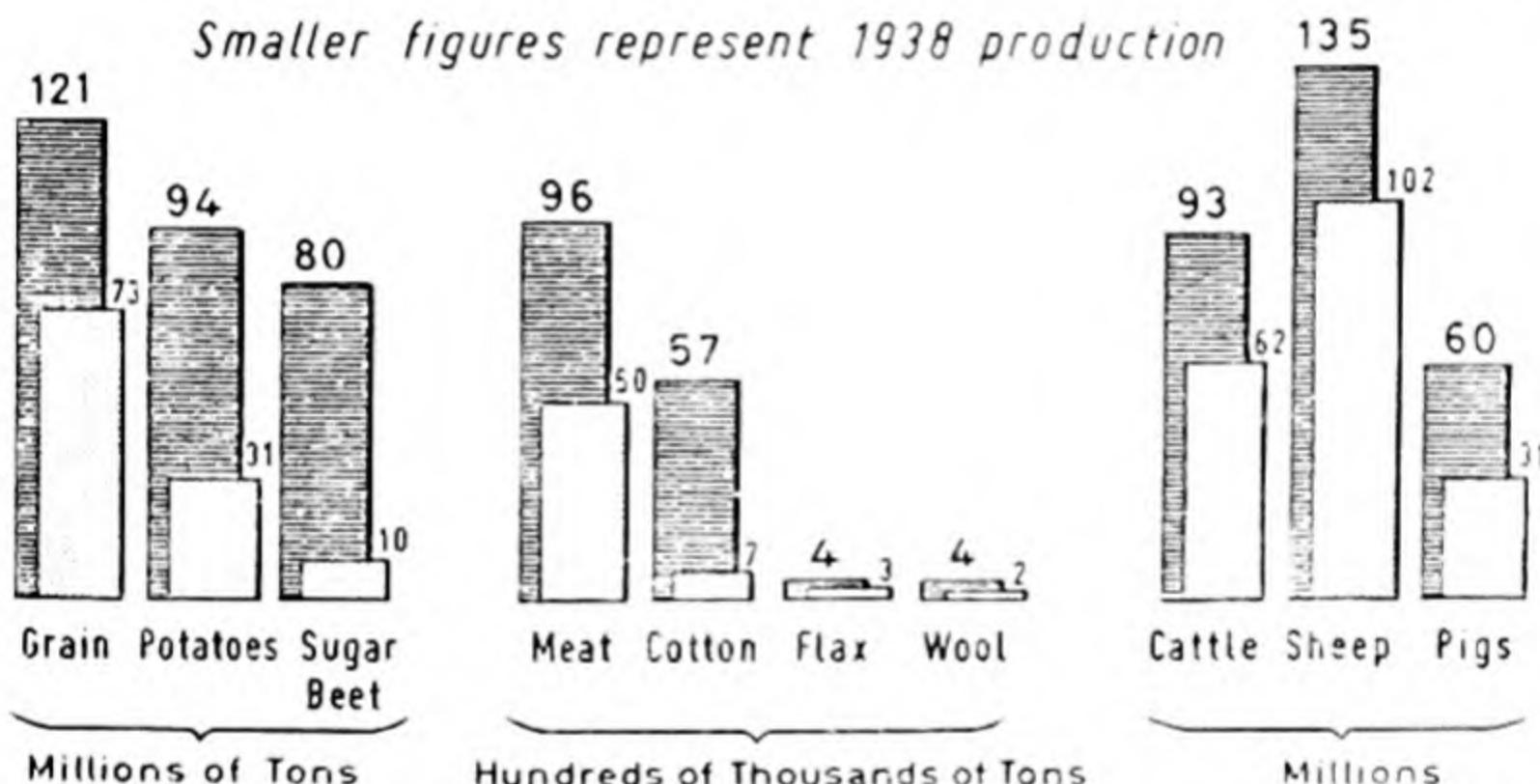


Fig. 45. PRODUCTION OF THE CHIEF AGRICULTURAL PRODUCTS IN THE U.S.S.R. IN 1965 COMPARED WITH 1938. (N.B.—The vertical scales of the above columns are not uniform.)

north of the area stretches the Kirghiz steppe, basis of the **Khazakh Soviet**. It is a region whose low and uncertain rainfall would only support a poor type of grass, but whose rich soil, with irrigation, is now being turned to good account. It was along this corridor of open grassland that various Mongol hordes of horsemen have passed from the Dzungarian Gate on the east to the Ural Gate on the west and so into Europe. For many generations the Kirghiz nomads wandered with their horses from the lowlands in the spring up into the mountain pastures of the eastern edge, only to return to the lowlands in the autumn, an example of transhumance.

Over much of the area nomads still wander with their yorts (black felt tents) and their horses and Bactrian dromedaries (two-humped camels), but the numbers of Astrakhan sheep have much increased. Kazakhstan is now one of the most important cattle-rearing regions of U.S.S.R., there being over 10 million head, which are kept in sheds and fed with silage during the cold winters. Many horses and goats are reared. Agriculture is carried on by means of irrigation. 100 million

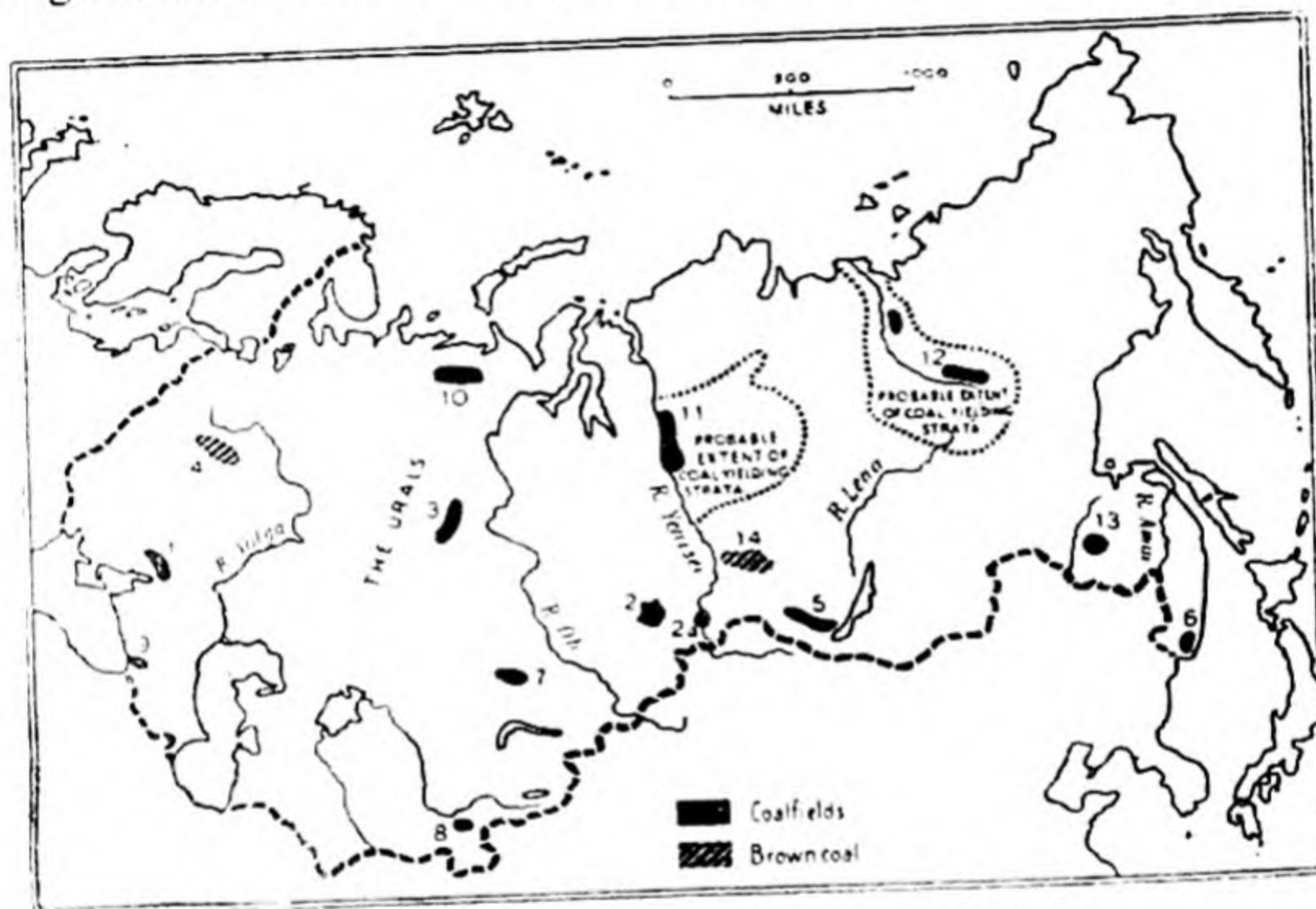


Fig. 46. THE COAL-FIELDS OF THE U.S.S.R.

- 1. Donbas. 2. Kuzbas and 2a Minusinsk. 3. Ural. 4. Moscow (brown coal). 5. Irkutsk. 6. Far East. 7. Karaganda. 8. Central Asia. 9. Trans-caucasia. 10. Pechora. 11. Tunguz. 12. Yakut. 13. Bureinsk. 14. Kansk (brown coal).

acres have been brought under cultivation, but there have been many complaints of inefficient farming. In the north the chief crops are wheat, barley, and millet, and in the south cotton, sugar-beet, oil seeds, rice, and tobacco. Many drought-resisting crops have been introduced, e.g. kendyr, a plant grown for its fibre, and others which yield forms of rubber, one of the few products which cannot be obtained from within the borders of U.S.S.R. from established sources of supply. There is a danger of over-cultivation of the steppe, with conse-

quent soil erosion and "man-made" deserts if "dry farming" is carried too far, as happened in many other areas of 8 in.-15 in. annual rainfall, *e.g.* the American "dust-bowl." The southern output has been achieved by damming the Syr Darya at Kzyl-Orda, resulting in the irrigation of about 100,000 acres of rice, 750,000 acres of cotton, and much beet and grain.

Fishing is important in the Caspian and Aral Seas as well as in Lake Balkash. Canning industries have been set up, *e.g.* at Guryev at the mouth of the Ural River on the Caspian where sturgeon is the chief fish caught, mainly for caviare. Pollution by effluents from the oilfield has resulted in a decreased catch locally so that the Russian fishermen have encroached on the Iranian area to the south.

Kazakhstan is rich in mineral wealth, mainly in its eastern mountainous area. The Karaganda (398,000) coal-field yields over 30 million tons annually. This is used by steel works, cotton-ginning mills, meat-packing factories, sugar refineries, tobacco factories, tanneries, and canning factories. The Soviet is the chief producer of non-ferrous metals in the Union and huge plants have been erected to deal with them, *e.g.* lead at Leninogorsk and Chimkent (150,000) and copper at Kounrad (50,000) on the shores of Lake Balkash. There is an oil-field in the Emba River Basin north-east of the Caspian, which has now been extended to offshore islands. Phosphates are produced for fertiliser. Other minerals are zinc, nickel, chrome ore, and molybdenum.

The capital, Alma Ata (580,000) lies in the high south-eastern part. Its name (Father of Apples) gives some indication of its garden city nature. Semipalatinsk (190,000) is a bridge town on the Irtysh and has a meat-packing industry.

To the south of the Kirghiz steppe lies the semi-desert and desert area of Turkistan. There has been even greater agricultural development here because of the opportunities for irrigation afforded by the more frequent rivers, particularly the Syr and Amu Daryas draining into the Aral Sea.

Uzbekistan consists of the area extending from the western shores of the Aral Sea south-eastwards across the semi-desert plain of Kizil-Kum (Red Sands) to the foothills of the Tien Shan and Pamir Plateau. The southern upland area is dissected by the valleys of the Ferghana, Syr and Amu Darya, Zarevshan, and Chorchik rivers. These form the most

sheltered and pleasant parts of the Soviet for they run mainly from east to west and are screened by the mountains from the cold north winds. The soil is fertile, consisting mainly of loess. Fruit growing is important, especially figs and pomegranates. Almonds are also widely grown. On the more open plains the Syr Darya is used to water some 5 million acres of land. The chief canal, the Great Stalin Ferghana Canal, completed in 1940, irrigates 1½ million acres. The chief crop is cotton, over 2½ million acres being devoted to it. The area produces 60 per cent. of U.S.S.R.'s crop, which



Fig. 47. U.S.S.R.—MINERALS OTHER THAN COAL.

in 1960 amounted to 4·3 million tons. Incidentally, American negroes were brought in to instruct the Uzbeks in cotton cultivation. There has been a great deal of experimenting with tropical crops, e.g. guayule, a Mexican rubber-yielding plant. Other crops are rice, sunflowers (oil seeds), bast (fibre-yielding), sugar-beet, mulberry trees (silkworms). Vines are important, and Uzbekistan exports dried fruit (raisins, sultanas, apricots), canned fruit, and wine to other parts of the Union. Wheat growing has declined because the grain can be brought in by the "Turk-Sib" Railway, thus releasing

the land for more suitable crops. Barley, maize, and wheat are grown on un-irrigated land on extensive lines with the aid of tractors and combine harvesters. Indeed, mechanisation has been widely adopted, even the cotton being picked by machinery.

Pastoral farming is important, there being over 6 million animals, mainly horses, cattle, sheep, and camels. Kara Kalpakia, in the lowlands near the Aral Sea, is the chief wool producing region of the Soviets, the karakul (astrakhan) sheep being reared on the poor steppe.

Mineral wealth is obtained mainly from the upland areas, there being sulphur, oil, copper, and phosphates. Tashkent once a noted caravan route centre, now capital of the Soviet, is situated on a spur of the Alexander Range in the east of the country. It has important agricultural machinery works as well as cement, sulphur, chemical, leather, cotton, and silk industries. It is in the midst of fertile oasis country and is surrounded by orchards and irrigated fields and meadows. Other old caravan centres are Bokhara, with its traditional carpet industry, and Samarkand, a food processing and cotton-spinning town.

The **Turkmen S.S.R.** stretches from Uzbekistan in the east to the Caspian in the west, and is bounded to the south by the Elburz and Hindu Kush, which divide it from Iran and Afghanistan. A large proportion of it consists of the Kara Kum (Black Sand) Desert. This desert is being developed for cattle rearing, for amongst the sands there are tracts of grass near surface water. In minerals it is also promising, because it has large deposits of soda, bromine, sulphur, potassium, salt, and sand for glass making, and gypsum. There is an oil-field near the east shore of the Caspian.

Irrigation has been developed and by its aid good crops of Egyptian-type cotton are grown. In September 1950, a much more ambitious scheme was announced to improve and extend irrigation in this area, and to create an inland waterway of about 700 miles, having the effect of linking the Turkmen S.S.R. with the centre of European Russia by water. The waterway is to be called the Turkmenian Canal and is to run from the Amu Darya to Krasnovodsk on the Caspian. From there barges will then proceed via the Volga system to

Moscow. To raise sufficient water for the Canal a dam is to be built at Takhya-Tash on the Volga. Not only will the scheme provide a new means of transporting goods in bulk, but also hydro-electric power will be generated for new industries, large areas of the hitherto useless Kara Kum will be irrigated principally for cotton, and the pasture lands near the south of the Caspian will be greatly improved.

In the southern foothills there are many melons, vines, and fruits. Wheat is also grown, as well as ramie, a fibrous plant used to make artificial silk. Silkworms are fed on the mul-



Fig. 48. THE INDUSTRIAL REGIONS OF U.S.S.R.

berry leaves. Large numbers of karakul sheep are reared for their good quality wool as well as horses noted for their speed and stamina. Raw materials have led to industrial development, e.g. cotton ginning, spinning and weaving, silk, meat-packing, leather goods, and glass-ware. Fishing is an important occupation on the Caspian shores, sturgeon, salmon, herring, and perch being caught. The industry is centred at Krasnovodsk, terminus of a railway linking the country with the "Turk-Sib" line at Tashkent.

The capital is Ashkhabad (210,000) which, like those of the other neighbouring Soviets, is situated on the more developed

and densely populated mountain fringe. In October 1949 it was almost completely destroyed by earthquake, with resultant great loss of life. The ancient city of Merv is situated on an alluvial fan where the Murghab River loses itself in the sands, but creates an oasis of fertility.

Tajikistan, in the south-east, is a terraced country ascending to and including the highest part of the Pamir or "Roof of the World." The northern boundary is formed by the Altai Range, from which spurs run southwards. These are separated from each other by deeply eroded valleys of tributaries of the Amu Darya. Pastoral farming is very important, there being some 600,000 head of cattle and 2 million sheep and goats. Tajikistan rears the gissar breed of fat mutton sheep, largest in the world, as well as karakul wool sheep. In the lower parts of the valleys cotton and grapes are grown. The former, long-stapled Egyptian, is an important crop, grown under irrigation. A large dam has been built where the River Iraksh enters the plain. The reservoir irrigates 300,000 acres, mainly for cotton, but rice, apricots, mulberries, sweet melons, and vegetables are also grown. Under collective farming the Tajiks have much improved their standard of living, for they have a share in the profits. They use modern methods, e.g. sowing by mechanical drills, picking by machinery, and spraying the crops from aeroplanes. Power generated at the dam is used for the cotton cleaning machinery and for pressing oil from the seed. Another dam, 590 ft. high, on the River Worsob near Dyushambe is used chiefly for generating hydro-electricity. Nitrates for fertilisers are extracted from water and air; water is reduced to oxygen and hydrogen and the latter is combined with nitrogen extracted from the atmosphere. Cane-sugar is grown in the extreme south, the only cane-sugar grown in the Union. The finest fruits of U.S.S.R. are also grown in this area, especially apricots and grapes. Other orchard products are apples, pomegranates, almonds, pistachio nuts, and walnuts.

Wheat and barley (some 1½ million acres) are grown without irrigation, the latter at high altitudes. It is now being grown at a height of 10,000 ft. on the southward slopes of the Pamirs, where grapes are cultivated up to 6,000 ft.

Mineral wealth is extensive. There are rich deposits of brown coal, useful for generating electricity, as well as petro-

eum, gold, lead, zinc, uranium, radium, arsenic, bismuth, asbestos, and mica. Many of these are as yet unexploited, but they have great potentialities and much progress has been made in mining during recent years. Textile, leather, and canning industries have been developed.

Perhaps the most interesting of all city developments in the Southern Soviets has been at Dyushambe, the capital. It is situated in a fertile valley on an inland delta and was originally a small market village called "Monday" after its market day. To it the local mountaineers brought karakul skins, silk, and carpets. In 1929 it was reached by the railway and became the capital of the Soviet. Its population is 224,000. A railway links it with Termez.

To the north of Tajikistan lies another mountainous Soviet, **Khirghizia**, which borders to the east, Sinkiang. The mountains are part of the Tien Shan and enclose high plateaux, on one of which is the high lake Issyk-Kul. The highest parts are ice- and snow-covered, and on the northern exposed slopes there are fir trees, contrasting with the walnuts of the sheltered southern slopes. The Khirghiz, a nomadic people, were declining in numbers until recent years. Most of the people, mainly Khirghiz but including others like the Dungans, live in the sheltered valleys of the north, e.g. the shorelands of Issyk-Kul, and the Ferghana valley of the south-west. Collective farming has turned the people from their nomad life to settled cultivators. The good soils of the valleys provide fine pastures for about 3 million head of stock, especially wool sheep. Irrigation has been extended to 2 million acres producing in the north sugar-beet, opium poppies, and tobacco and, in the south-west, cotton and rice. There are many apple-orchards in the north, contrasting with the sub-tropical apricots, vines, and mulberries of the south-west. Wheat and barley are grown without irrigation in the north and maize in the south-west. There is fishing on Issyk-Kul.

High-grade coal is mined at Tash-Kamyra and Koh Yungah, and hydro-electricity is generated on the Naryn River. Oil and natural gas are also used by the increasingly important manufacturing industries, which are already providing 55 per cent. of the value of Khirghizia's production. Other minerals produced include antimony, mercury, gold, and sulphur. Among the industries are textiles, artesian well pumps,

and furniture at Osh (110,000), clothing and shoes at Maryn, shipbuilding and meat and fish canning at Rybache and cement and sugar refining at Kant.

The capital, Frunze, has had a similar recent history to that of Dyushambe. A few years ago it was a small primitive town, and now it is a well planned city with a population of 385,000 (1939, 93,000).

Enough has been said to show that it is in the open grass-lands of the south-west and their mountain fringe, accessible to European Russia and with less severe climatic conditions, that most progress has been made. Apart from a belt along the Trans-Siberian Railway and its branches, the difficult forest and mountain areas of the north-east remain relatively undeveloped.

Airways in U.S.S.R.

The development of airlines in the Central Asiatic regions of U.S.S.R. has done much to open up the country and to bring into communication with each other areas separated by deserts or mountain ranges. Altogether there are about 160,000 miles of airlines in the whole of the U.S.S.R. including the longest trans-continental airway in the world, from Moscow to Vladivostok (5,000 miles). This route runs via Kazan, Sverdlovsk, Omsk, Novosibirsk, Krasnoyarsk, Irkutsk, and Chita, *i.e.* along the Trans-Siberian Railway. From Krasnoyarsk there is a service to Kirensk and Yakutsk, and from Irkutsk, one via Ulan Bator to Peking and Shanghai. Another main route from Moscow is via Tashkent and Alma Ata to Sian and thence to Peking or Chungking. From the latter there is a service to Mandalay and Rangoon. As an example of the value of airways in linking up difficult regions there is the line from Moscow to Anadyr, in North-Eastern Siberia, which carries passengers, mails, and freight for most of the year and calls at such isolated centres as Igarka. Indeed, Igarka and Yakutsk have developed into quite important airway junctions.

CHAPTER XIX

ECONOMIC GEOGRAPHY OF ASIA

In the foregoing chapters we have mentioned the main products of each country, but that does not give a comprehensive picture of the economic wealth of the continent as a whole. There are great differences in stages of development and in the organisation of the economic life in various parts of the vast area. In some regions, notably in the North-Eastern U.S.S.R., very little progress has been made from the hunting and collecting stage, whereas in South-Western U.S.S.R. the people have bounded in less than one generation from nomadic wanderers to scientific cultivators and factory workers. They have overtaken and even passed the peoples of the ancient civilisations of India and China, the great majority of whom are still leading the same type of life as their ancestors of centuries ago.

Let us now try to assess the relative importance of the countries from the economic point of view, taking the chief products in turn. The statistical tables give the latest available figures, averaged over three years.

Many of the countries of Asia have recently gained their independence from colonial status. The spirit of nationalism is strong although many of these countries have linguistic or religious minority problems. They are seeking to improve their very low standards of living by developing their economic resources—by improvements in agriculture and by industrialisation. But these things demand vast capital expenditure, and the chief difficulty is to find this capital.

The Colombo Plan for Co-operative Economic Development

Most of the countries referred to in the above paragraph are to be found in the area extending from West Pakistan to Borneo. Here dwells one-quarter of the world's population in about one-sixteenth of the area. In the years 1954-9, this population had increased by 58 million, and the rate of increase is being maintained. By 1950 it had become obvious

that something drastic would have to be done to alleviate the existing distress and to prevent it from becoming even worse. The idea of a Plan was first proposed at the Commonwealth Foreign Ministers' Conference in 1951, and the first meeting was held in Colombo in that year. The members of the Plan, of whom there are now fifteen Asian countries, meet each year to submit development projects and to report progress of those already begun. Because the region could not possibly achieve very much from its own capital resources and technical skill, the Plan meetings are attended by the representatives of the United Kingdom, U.S.A., Australia, Canada, New Zealand, and Japan. By 1960 these outside countries had contributed the vast sum of £2,857 million in grants, loans, and credits. In addition, much valuable aid has been given by sending out scientists and technologists and by receiving students for training. In addition, the Colombo countries have shared in the aid given by U.S.S.R., quite independent of the Plan. It must not be supposed, however, that the Asian countries rely entirely upon help from outside. They have achieved much on their own and helped each other by pooling their resources and individual skills, e.g. India has trained large numbers of students from other member countries. Many of the projects mentioned in regional chapters have been carried out under the Colombo Plan, e.g. the Canada Dam.

Wheat

The principal wheat-growing countries are U.S.S.R., China, India, and Pakistan. In the former the chief region is the steppe-land belt along the line of the Trans-Siberian Railway between the Urals and Semipalatinsk. Here spring wheat is sown after the snows have melted and the wheat germinates quickly in the moist soil, being helped by fairly frequent

WHEAT: AVERAGE PRODUCTION
(MILLIONS OF TONS)

Russia (including European)	68	Turkey	..	..	8
China	32	Pakistan	..	..	5
India	12	Japan	..	..	1.7

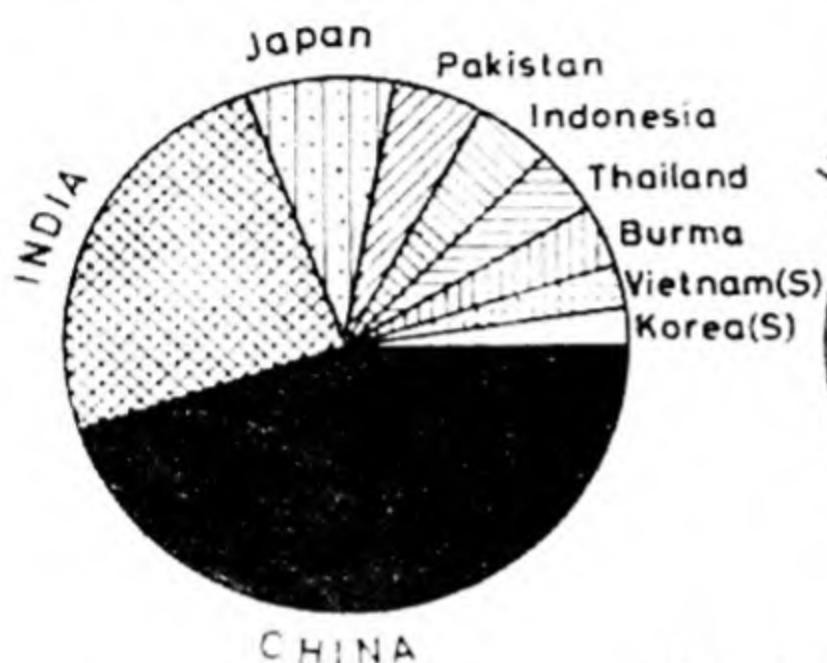
showers, and being nourished by the rich humus-laden black earth. This area helps Russia very greatly to achieve the

position of world's greatest wheat grower, for it is second only to the Ukraine in the whole of U.S.S.R.

In India the wheat is sown towards the end of the rainy summer monsoon (September) and is cut in January. Irrigation water is used to fill out the grain in the later stages.

Other important wheat lands are China (in the Lower Yangtse and Hwang-Ho basins and Manchuria) and Turkey.

RICE PRODUCERS



COTTON PRODUCERS

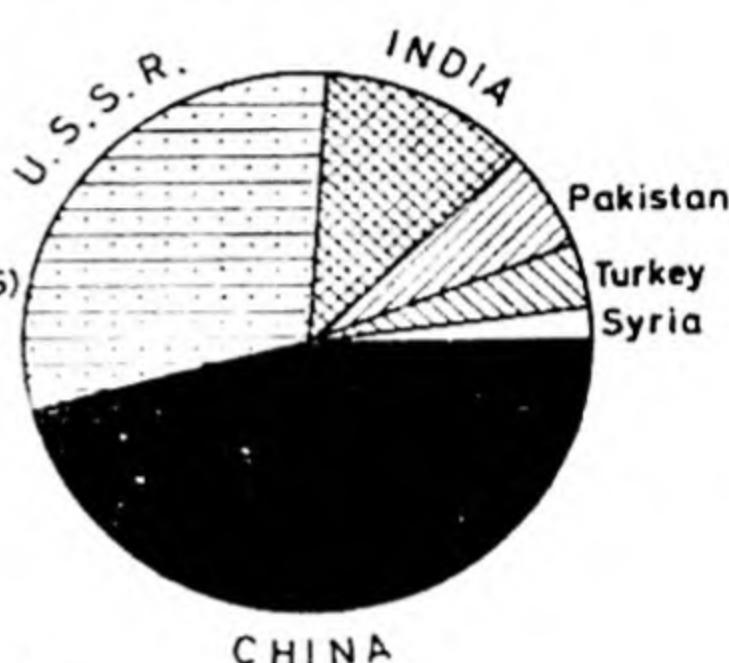


Fig. 49.

Rice

Rice is the outstanding crop of the monsoon lands. In the early stages of its growth it must be under water. The seeds are sown in flooded fields and, when about six weeks old, the seedlings are transplanted. After a time the water is drained off and the grain ripens. On the lowlands irrigation is used, but on terraced hillsides rice requires over 60 in. of rainfall. In the East Indies, with double rainfall maxima, two crops

CHIEF RICE GROWERS (MILLIONS OF TONS)

China	175	Thailand	9
India	50	Burma	7
Pakistan	16	Japan	6
Indonesia	13	Vietnam (S.)	5

Burma, Thailand, and Formosa are the chief exporting countries, and Japan, India, Malaya, Indonesia, and Ceylon, the chief importing ones.

a year may be grown. The chief producers are China, India, Burma, Thailand, and Indo-China. Of these, China and India need all the rice they can grow and have to import some to feed their huge populations, some of whom are turning

increasingly to wheat. The others have surpluses for export. A comparatively new arrival on the list of rice growers is U.S.S.R., which is producing considerable quantities by irrigation in the Sea of Aral region. Development of "miracle" rice by U.S. scientists in the Philippines has added greatly to the yield. Thus Japan, partly because of this, has a surplus. India has become self-sufficient but the continued population increase may soon again outstrip production.

Tea

The tea plant, a leafy bush, is most probably a native of China. It requires plenty of rainfall in summer with high temperatures, but it stands up to cold winters. It is grown on hill slopes for it requires good drainage. At one time China was the greatest producer, but she has now been surpassed by India. India is also the greatest exporter, retaining only about one-quarter of her production. There are 6,000 tea gardens in India, covering $\frac{3}{4}$ million acres and employing 1½ million workers. The leaf varies in size and quality according to the climatic conditions under which it is grown; thus in the Equatorial rain belt of the East Indies the leaves are very coarse. Tea seed oil is now being exported from India to be used as a substitute for olive oil.

TEA: WORLD PRODUCTION

(THOUSANDS OF TONS)

India	..	..	370	Indonesia	..	..	44
Ceylon	..	..	220	U.S.S.R.	..	..	38
China	..	..	157	Kenya and Tanzania	..	..	31
Japan	..	..	90	Bangladesh	..	..	25

India and Ceylon are by far the largest exporters.

Rubber

Although the *hevea* tree, whose latex yields para rubber, is a native of the Amazon lowlands, well over 95 per cent. of the world's rubber is obtained from South-East Asia, where the conditions are ideal. By far the most important producers are Malaysia, the Philippines, and Indonesia. The weakness of the industry, the tendency to over-produce, thus lowering the price below an economic level, has again become apparent. U.S.A., the chief user of motor-transport, is the main importer, despite her huge synthetic rubber industry.

PRODUCTION OF NATURAL RUBBER
(THOUSANDS OF TONS)

Malaysia	890	Ceylon	175
Philippines, Indonesia ..	630	Vietnam, Cambodia ..	78
Thailand	220		

Cotton

Providing sufficient moisture can be obtained from irrigation, cotton can be successfully grown in any country with high summer temperatures, an average of two hundred days freedom from frost, and a rich heavy soil. Indeed, better quality cotton is grown on the average in dry areas using irrigation than in those which rely on rainfall. Most Asiatic cotton is grown with the aid of irrigation, with the exception of the low grade variety produced in the Western Deccan. The chief growers are China, India, Pakistan, and Soviet Russia. U.S.S.R. is now self-supporting in raw cotton.

COTTON PRODUCTION
(THOUSANDS OF TONS)

China	2,000	Pakistan	337
U.S.S.R.	1,491	Turkey	300
India	930	Syria	139

Sugar

Most of the sugar grown in Asia comes from the sugar-cane and is therefore obtained mainly in the south-eastern countries. India and China are the world's second and fourth largest producers respectively, but their outputs are needed by their own populations. The chief Asiatic exporters of sugar are the Philippines, Taiwan, and Indonesia.

SUGAR PRODUCTION
(THOUSANDS OF TONS)

India	3,600	China	1,250
Pakistan	1,855	Taiwan	756
Philippines	2,400	Indonesia	604

MINERAL WEALTH

Petroleum

Mineral oil is usually found on the flanks of fold systems so that, although Asia is not yet the greatest producer, it has the greatest possibilities of future development.

One of the most significant factors in world political and economic fields to-day is the greatly increased importance of the Middle East countries because of the enormous growth of the petroleum production of the Persian Gulf states. In 1966 these countries produced 384 million tons of oil, nearly as much as the United States. They contain two-thirds of the world's proven reserves of oil, and their share of the total world output has risen from 6 per cent. in 1938 to 9 per cent. in 1946 and 26 per cent. in 1963. The Middle East oil-fields are the main source of non-dollar crude oil for the refineries of Great Britain and Western Europe, and, indeed, of Asia and Australia as well. Vast sums of money are now being received as oil royalties by backward and undeveloped countries in the Persian Gulf, and the impact of this sudden wealth is producing many political, economic, and social problems. However, the recent large-scale developments in North Africa, and the emergence of the U.S.S.R. as a European exporter may tend to alter the present situation.

Iran was the first modern producer in the Middle East. However, Iran's output has been greatly surpassed by that of Kuwait which is under joint Anglo-American control. American interest is caused by their concern at diminishing production in the homeland.

The U.S.S.R. produces over 200 million tons a year, but only about 10 million tons of this is from Asiatic fields. Great attention is being paid to the expansion of output in Turkmenia, which in 1959 yielded 4½ million tons, whilst Uzbekistan produced 126 million cubic yards of natural gas. Other oil-fields are being developed in the Upper Ob and Lena Basins, in Ferghana and on Sakhalin Island. That the Russian output is increasing rapidly may be judged from the fact that recently not only have pipe-lines been built to supply the satellite countries and Eastern Siberia, but also markets are being sought in our own country, Italy, India, and many others.

To handle Middle East oil vast fleets of tankers are in use and their tonnage is increasing rapidly, new vessels of up to 300,000 tons being under construction. In addition, there are great lengths of pipe-lines, such as the 30-in. diameter line from Dahran near Bahrain to Sidon on the coast of Lebanon,

which is over 1,000 miles long. The object of these pipe-lines is to save part of the cost of maintaining fleets of tankers to bring oil from the Persian Gulf to Europe via South Africa (the Dahran-Sidon pipe-line is equivalent to sixty tankers). The Suez dispute showed that pipe-lines through Arab countries are very vulnerable to political risks, and the latest pipe-line projected is to run from the new Qum oil-field in Iran through Turkish territory to the Mediterranean at Iskanderun.

OIL PRODUCTION
(MILLIONS OF TONS)

Kuwait	100	Qatar	11
Saudi-Arabia	100	Brunei	5
Iran	97	China	8
Iraq	62	Abu Dhabi	14
Indonesia	27	Bahrain	2
Kuwait Neutral Zone ..	20	India	1½
Asiatic U.S.S.R. ..	10		

Coal

China is considered to be the country with the greatest coal reserves in the world, and there has been a rapid expansion of output in recent years (220 million tons). Other coal-fields are in Asiatic Soviet Russia (150 million tons), in Japan (50 million tons), in India (68 million tons), in Turkey (6 million tons), in South Korea (5 million tons), in Formosa (4 million tons), and in Indonesia (1 million tons).

Iron

Most of Russia's iron ore is mined in Europe, but output is increasing rapidly in the Telbes region (Kuzbas) and there are new fields near Komsomolsk on the Lower Amur. Indian ore comes chiefly from north-east Deccan. China has immense reserves, barely touched except in Manchuria and around Wuhan.

IRON ORE PRODUCTION

(MILLIONS OF TONS IRON CONTENT)

U.S.S.R.	92	India	23
China	[35]	Malaysia	4
		Japan 2	

Most of Russia's steel is made in Europe, and the largest Asiatic producers are Japan (using mainly imported ore) and China. In the last few years output has increased greatly in China. Many small village furnaces have been set up, and the output of pig-iron and steel from these, while not of very high quality, has added appreciably to the total.

STEEL PRODUCTION
(MILLIONS OF TONS)

U.S.S.R. . . . .	..	..	76	China . . . . .	..	..	..	12
Japan . . . . .	..	..	94	India . . . . .	..	..	..	7

Tin

Here, as in rubber production, the Malaysia-East Indian region easily leads the world, producing over 50 per cent. of the total. Most of the tin is dredged from the rivers (alluvial mining), so that there must be large reserves waiting to be mined in the native rock. Malaysia yields over 70,000 tons (pre-war 80,000) smelted mainly at Penang. Other producers are Thailand (18,000 tons) and Burma. Much of their ore is smelted in Singapore. Indonesia produces 22,000 tons, much of which is sent to Holland for smelting. China produces about 18,000 tons in Yunnan and Kwangsi.

Gold

By far the chief producer is U.S.S.R., second only to the Union of South Africa in the world. The principal field is that of the Lena Basin, but gold is also mined in the Central Asiatic Highlands and the Far East Soviet. Other gold mining countries are India, Annam, Korea, Manchuria, and China.

Summary

Since 1939 the economic geography of Asia has undergone many profound changes. Rapidly increasing population combined with the ravaging effects of international and civil war has meant that, with the notable exception of petroleum in the Middle East, the continent has had less to offer the rest of the world. Indeed, even the development of the petroleum industry has been hindered by the troubles in Israel and Egypt so that work on new pipe-lines has been held up or hindered by sabotage.

The effect of increasing population may be judged by a comparison of the figures for 1938, 1960, and 1970:—

POPULATION (IN MILLIONS)

		1938	1960	1970
CHINA ..	.. ..	440	670	740
INDIA AND PAKISTAN ..		370	495	652
JAPAN ..	.. ..	71	94	105
INDONESIA ..	.. ..	68	93	126
TURKEY ..	.. ..	17	24	26
KOREA ..	.. ..	22	33	43
PHILIPPINES ..	.. ..	16	25	38
CEYLON ..	.. ..	9	12	13

In these countries alone there has been in thirty-two years an increase of 723 million mouths to feed and bodies to clothe. This represents an average annual increase of 2 per cent. Assuming this rate is maintained, the total population of these countries is increasing at the rate of 35 million a year

QUESTIONS

1. When it is 9 p.m. in London what time is it in Merv, Tomsk, Yakutsk, Vladivostok?
2. Write an essay on Fold Mountains, taking your examples from Asia. Illustrate by diagrams or maps.
3. Write notes on—mountain knots, massifs, syncline, sediments, volcanoes. Take examples from Asia and draw diagrams.
4. Describe in detail the Pacific coastline of Asia and show how this is related to the relief and structure.
5. Classify the lakes of Asia according to their mode of origin and give the chief characteristics of each type.
6. What is meant by the beheading of rivers? How many examples can you find on the map of Asia?
7. Write a detailed account of the Indian Ocean coastline on the lines of Question 4.
8. Describe the courses of (a) the Ob, (b) the Indus, (c) the Yangtse-Kiang.
9. Compare the Arctic Ocean coastline with those of the Pacific and Indian Oceans, and account for any differences in their characteristics.
10. Name the chief "controls" which affect the climate of Asia and show how they affect it.
11. Study (a) the winter rainfall, (b) the summer rainfall maps of Asia. Note the pressure and winds and try to show how these affect the distribution and amount of rainfall.
12. Study the annual and seasonal rainfall maps together with that showing relief, and show what effects the latter has upon the rainfall.
13. Making use of all available maps and the climatic statistics compare and contrast the climates of the monsoon lands and the Japanese Archipelago.
14. On a map of Asia draw the January and July isotherms taken from an atlas. Where the former cut the latter note the difference of temperatures. Then on another map mark the points of intersection by dots and insert the range of temperature at each point. Use these to draw lines joining places of equal range of temperature e.g. 10°, 20°, 40°, etc. What do you learn from this map?
15. Selecting one station from each climatic region and using the rainfall statistics, draw columns to represent in each case the December, January, February; March, April, May; June, July, August; September, October, November rainfalls. Point out any special features of the seasonal rainfalls that you may notice.
16. Study the climatic statistics for places in the monsoon areas. Account for the differences that you notice. Be on the lookout, not merely for differences in summer and winter temperatures or total

rainfalls, but also for minor points, e.g. month of maximum temperature or rainfall.

17. Compare and contrast the climates of the Iran, Turan, and East Mediterranean Type.

18. Describe the relief, climate, and natural vegetation that would be met with on a journey along a line drawn from Cape Comorin to East Cape, (a) in summer, (b) in winter.

19. Carry out a similar exercise with reference to a journey along lat. 40° N.

20. By referring to examples from Asia show how natural vegetation adapts itself to climate.

21. Write an essay on irrigation, taking examples from Asia.

22. Draw a section across Arabia from Aden to Kuwait using the largest scale map in your atlas.

23. Compare and contrast the islands of Cyprus and Ceylon under the headings: (a) Relief and Structure, (b) Climate, (c) Natural Vegetation, (d) Economic Products.

24. Write an account of the distribution of population of Palestine and show how it is related to the relief.

25. Draw a map of Syria showing relief and railways and show how the latter are influenced by the former.

26. Describe the development of the petroleum mining industry of the Middle East and show how the oil is conveyed to the ports.

27. Describe the positions and account for the importance of: Damascus, Haifa, Jerusalem, Baghdad. Illustrate by maps.

28. Write an account of the economic geography of Iraq.

29. Compare and contrast the economic geography of Turkey and Iran and give reasons for your statements.

30. Describe the fruit-growing industry of the Middle Eastern countries.

31. Draw a section across Iran from Bandar Shah to Bandar Abbas. Describe the relief, climate, and natural vegetation that would be met with on a journey along the line of the section.

32. Compare and contrast the basins of the Indus and Ganges under the headings Relief, Climate, and Economic Development.

33. Using the material provided in this book write a geography of Pakistan, illustrating by maps.

34. Carry out a similar exercise for the Republic of India.

35. Describe the positions and account for the importance of: Karachi, Lahore, and Chittagong.

36. Compare and contrast the positions and importance of Madras, Bombay and Calcutta.

37. Describe and account for the distribution of population in the Indian sub-continent.

38. Write a geographical account of the State of Hyderabad.

39. Draw a map of the main railway system of the Indian sub-continent and write a description of the network, bringing out the influence of relief.

40. Write an account of the economic geography of Burma.

41. Draw a section across Burma along the latitude of Mandalay. Describe the relief as shown by the section.

42. Examine the photographs of the Burmese teak industry and write a description of the features noticed.

43. Compare the deltas of the Indus, Ganges, and Irrawaddy, from as many points of view as you can.

44. Why are Singapore, Colombo and Aden such important shipping centres? Draw maps to illustrate your answer.

45. Summarise the economic geography of the Malay Peninsula.

46. Compare and contrast the islands of Borneo and Formosa.

47. Write a geographical account of the Indonesian Republic.

48. Give an account of the rice-growing industry of Asia, finding as much data as you can from photographs.

49. Examine the photographs of racial types and note any features distinguishing the various races from each other.

50. Give a reasoned account of the distribution of population of the Malayan and East Indian area.

51. Describe the positions and account for the importance of Bangkok, Hanoi, Jakarta. Illustrate by sketch maps.

52. Taking the River Yangtse as the dividing line, compare and contrast Northern and Southern China.

53. Draw a map of China inserting the rivers and large towns. Comment upon the distribution of the latter.

54. Draw a section along the course of the Hwang-Ho. What can be learned from it?

55. Write a detailed description of the coastline of China.

56. Write a geographical account of the island of Honshu.

57. Describe and account for the distribution of population of Japan.

58. What was the economic importance of her former territories—Korea, Manchuria, and Formosa—to Japan?

59. Divide Manchuria into regions and write an account of each.

60. Write an account of a journey across Asia along the Trans-Siberian Railway involving a description of the relief, vegetation, and economic development.

61. Draw a map of U.S.S.R. and mark and shade on it the regions of natural vegetation. Describe the influences of relief and climate upon the distribution of these regions.

62. With what difficulties have the Russians had to contend in the development of the Tundra and what steps have they taken to overcome these difficulties?

63. Give an account of the relative importance of the various coal-fields of Asiatic Russia and mention the industrial development which has taken place in each case.

64. Contrast the conditions which prevailed in the Asiatic steppe-lands of Tsarist times with those of to-day.

65. On a map of Asiatic U.S.S.R. mark and name the chief towns. Comment, with reasons, upon their distribution and write short notes upon the importance of each.

66. Write notes on Kuro Siwo, seed pearls, fish-traps, transhumance, yours.

67. Contrast life on a tea plantation in Ceylon with that on a collective farm in Uzbekistan.

68. Why are we justified in calling Asia the "Continent of the future"?

69. What changes in the political geography of Asia have taken place since 1939?

70. It is possible to learn much about the geography of an area by an intelligent study of photographs. Use those contained within this book to show that this is a true statement.

71. The same is even truer of maps. Draw a series of maps of India on the same scale as follows: relief (on drawing paper); on tracing paper—rivers, summer rainfall and winds, winter rainfall and winds, natural vegetation, economic products, railways, distribution of population. By transposing them in as many ways as possible bring out the effects of the various phenomena upon each other and write down the results of your observations.

72. Carry out a similar exercise for China.

73. Draw a map of Ceylon showing the distribution of crops. Show how this distribution is affected by relief and climate.

74. Carry out a similar exercise for Burma.

75. Compare and contrast the geographical conditions of the Philippines with those of the Japanese Archipelago.

EXAMINATION QUESTIONS

The following questions have been reproduced by permission of the various Examining Bodies concerned, from examination papers at the Ordinary Level of the General Certificate of Education. Questions marked with an asterisk are from *Alternative* papers.

(L.) London, (O.) Oxford, (O. & C.) Oxford and Cambridge Joint Board.

1. Approximately one-half of the world's people live in the south and east of Asia. Locate three areas, in different countries, which are very densely peopled. Draw a map of one of these areas and explain carefully why it has so many people. (O.)

2. Point out the differences which exist between the Urals industrial area and the industrial areas of Japan as regards situation, availability of raw materials, and the character of the goods produced. (O.)

3. Choose two of the following commodities: cotton; tea; rubber. Draw maps to show where, in Asia, the two selected crops are produced in large amounts. Describe the physical and climatic conditions found in these areas which especially favour the production of the crops. (O.)

4. (a) Draw a sketch-map to show the positions of the countries of western Asia which border the Mediterranean Sea and on it mark and name one important coastal town in each country. (O. & C.)

(b) Describe and account for the importance of each of the towns you have indicated.

5. (a) Explain why irrigation is necessary in parts of the Indian sub-continent.

(b) Write a brief explanatory account of the various methods of irrigation which are used. (L.)

6. Choose two river valleys in Asia: the first densely, the second very sparsely, populated. State the factors which contribute to the great difference in population density under the headings: (a) location; (b) climate; (c) resources. (O.)

7. Choose three of the following ports: Colombo; Smyrna; Haifa; Singapore; Shanghai; Vladivostok. Summarise for each of the three ports three main factors which contribute to its importance as a seaport. Add for each port a sketch-map to illustrate the points specified in your answer. Include necessary names. (O.)

8. The total area of India and Pakistan is less than that of Australia but their total population is over twenty times as big as that of Australia. How far can this difference be explained by reference to (a) relief, (b) climate, (c) resources? (O. & C.)

9.* (a) Draw a sketch-map to show the relief features and positions of the chief towns of the regions through which the Yangtse-Kiang flows after leaving the Tibet plateau; and (b) describe and account for the marked concentration of population in (i) the Red Basin, and (ii) the middle and lower basins of the Yangtse river. (O. & C.)

10.* Write a descriptive account of Japanese agriculture, emphasising the effects of relief and climate upon (a) the methods of farming, and (b) the distribution of the principal crops. (O. & C.)

11.* Compare and contrast the relief features, climate and principal crops of the lower basins of the Hwang-ho and Si-Kiang. (O. & C.)

12.* Select two areas, one from each of the following pairs:—

(a) Korea; Manchuria.

(b) Mongolia; Tibet.

Compare and contrast the important features of their geography.

(O. & C.)

13. In Japan more than 55 per cent. of the people are engaged in industry and trade; in China less than 20 per cent. are so engaged. Explain why industrial and commercial development has been relatively more rapid in Japan than in China. (O. & C.)

14. Give a brief geographical account of any two of the following:—

(a) The production of tea in the Indian sub-continent.

(b) The export trade of Malaya.

(c) The production of cereals in China.

(d) The mineral resources of Soviet Asia.

(e) The importance of Aden and Colombo on the sea route to the Far East. (L.)

15. Draw a map of India, south of $23\frac{1}{2}$ ° N. Insert and name three rivers, two ports, two inland towns; shade the areas (a) thickly forested, (b) densely peopled. Describe how the relief of the area affects (i) the July rainfall, (ii) the production of rice and cotton. (O.)

16. Contrast the island of Java with the north-western plain of Asia, which is completely continental, under the heads: (a) climate; (b) products; (c) character and density of the population. (O.)

17. Explain how the distribution of the population in the Ganges valley and in the Yangtse valley is affected by relief and summer rainfall. State details of the contrast between the Ganges delta and the Red Basin. (O.)

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